Insurance Companies Indicted for Data Theft

By Nancy French
Of the the CW Staff

DENVER – Fifty-six insurance companies have been indicted here for illegally obtaining individuals' confidential medical records, some of them computerized.

The indictments, charging conspiracy, impersonation and theft of trade secrets, were handed down by a grand jury following an eight-month investigation, District Attorney Dale Tooley said last week.

Among those indicted were attorneys, private investigators and others who allegedly obtained records illegally and then sold them to insurance companies, according to Tooley.

"The Denver operation is the tip of the iceberg," he said, adding that most of the companies' operations are in no way limited to Colorado. Tooley declined, however, to name any of the firms involved since action is still pending and said more indictments are expected.

Practice Not New

"Taking medical records without authorization has been going on for at least 25 years," Tooley said. Insurance companies use the information "to secure lower settlements of claims."

Many unscrupulous investigators secured detailed medical records from clinics, psychiatrists' offices, general hospitals and at least one military hospital, the district attorney's investigation found. The records stored in computerized files were turned over in the form of printouts, he said.

Tactics used by these investigators to obtain such records included posing as doctors and nurses on the telephone; dressing in clerks' attire to gain entry into record rooms; writing bogus letters requesting information; and paying persons within a hospital or from another hospital to act as "source agents," he said.

Tooley was tipped off about the scheme by an attorney representing a client whose records were obtained illegally, he said.

Evidence was obtained on those indicted through use of undercover police investigators who called medical record investigators to obtain records on individuals. One record obtained in this manner was that of the district attorney's secretary.

Two hundred dollars was a typical charge for a record obtained for an insurance claims adjuster who wanted to settle quickly, Tooley said.

To illustrate how the scheme might work,

(Continued on Page 6)

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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IBM Adds 3/15D, Nine Models of System 32

By Esther Surden
Of the CW Staff

ATLANTA – In response to user demand for increased on-line and remote processing capabilities, IBM last week introduced its top-of-the-line 3/15, the Model 15D, and nine lower cost System 32 models.

The System 32 models were also designed for entry-level small business applications, IBM said.

Also announced were industry application programs (IAP) for distribution finance and a set of programs for medical group practice for use with the System 32.

The upgrade path between the 15C and 15D is not direct; users must recompile application programs to run them on the 15D processor, IBM said.

Third Partition

Key to the announcement of the 15D were systems and communications programming enhancements to allow a third partition in main memory compared with two available for earlier models of the 15, IBM said.

This provides the user running communications and batch or batch in both partitions with a third area for program development, additional on-line applications or communications with a 370 mainframe, a spokesman said.

Communications Control Program (CCP) improvements include the ability of users to define up to 192 active files compared with 40 available on the 15 up till now; this capability will also aid in teleprocessing applications, the firm noted.

Users can now catalog programs from a batch partition directly into a CCP library, IBM said.

File sharing under the System Control Program (SCP) has been improved to allow sharing of more disk files between partitions and updating of files from different partitions, a spokesman said. On-line library capacity has been increased to 25M bytes compared with 10M bytes on the 15C.

Another enhancement, a CCP task-chaining technique, allows a user task to be initiated by another task without operator intervention, the company said. A program product that allows sorting un-

(Continued on Page 6)

Cable Burn-Out Brings Down N.Y. CPUs

By John P. Hebert
Of the CW Staff

NEW YORK – The burn-out of an underground feeder cable in Brooklyn recently disrupted electrical service to about nine million Consolidated Edison Co. (Con Ed) subscribers here, affecting the computer centers of the American Stock Exchange and the Federal Reserve Bank of New York.

Trading on the exchange floor halted for about 19 minutes when the momentary voltage dip caused duplex front-end communications processors to go down within 20 minutes of each other, according to Sherman Lachs, site director of one of the exchange's computer installations.

The two Communications Controls, Inc. processors service communications lines which transmit data to "the world" and to two Digital Equipment Corp. PDP-11/45s, he said.

Lachs noted the PDP-11 CPUs were unaffected by the voltage dip because they can recognize the electrical fluctuation.

The exchange's system is used to drive ticker tapes and handle all the on-line price quotations from the trading floor as well as serve stock quote vendors, Lachs explained.

"Once trading was halted, the mechanism to get it up had to be started again," Lachs explained. He did not say whether any equipment was damaged, but noted the shop is having an uninterruptible power supply (UPS) installed this month.

Six CPUs Down

Mike Blumer, chief of the General Computer Division at the Federal Reserve Bank of New York, said all six of the division's computers went down as a result of the power fluctuation.

The casualty list that day included the bank's dual IBM 370/155 CPUs, primarily used for batch processing, two Burroughs mainframes – a B6700 and a B7760 – and two Xerox Data Systems Sigma 5s, Blumer recalled.

All of the equipment came back up immediately after the disturbance except the Burroughs B6700, which was down for 20 minutes, he said.

When Blumer called IBM about the processors going down, IBM said it was receiving telephone calls from all over Manhattan, he added.

This was the first in a series of outages last month, according to Blumer, who now keeps records on all power disturbances which affect the DP shop.

Not quite one week after the first disturbance, the bank was hit by another, more localized disturbance centered in Manhattan, he said. That one was worse than the first, dragging both Burroughs processors down for four to five hours.

The B7760 lost one processor and 60% of its memory capacity for five hours, although the system was running 35 minutes after the disturbance took it down, he said.

But the B6700 had more serious problems. It couldn't be brought up for four hours; when it did come up, it was without one module of core memory, Blumer recalled.

Generally speaking, he said, the power disturbances happen in clusters, usually in summer, although the fluctuations seldomly affect the installation.

"Every day there is at least one incident, one fluctuation," but it isn't great enough to disrupt the computers.

"The only reason we know is because a power monitor checks all the disturbances. We see [them] every day on a record the power monitor keeps," Blumer said.

(Continued on Page 3)

Former OSI Employee Convicted Of Stealing Proprietary Software

By Catherine Arnst
Of the CW Staff

ROCKVILLE, Md. – A former employee of Optimum Systems, Inc. (OSI), located here, has been convicted of stealing that firm's software program used to maintain classified data for the Federal Energy Administration (FEA).

Bertram Seidlitz was found guilty on two counts of fraud by wire for illegally accessing OSI's system by using a Texas Instruments terminal located in his Alexandria, Virginia office to obtain 18 of 21 modules of OSI Wylbur, a proprietary text-editing system, between Dec. 15, 1975 and Jan. 9, 1976.

The conviction has been obtained, but the motive remains cloudy. Seidlitz, employed by OSI last year from Jan. 1 to June 17 as deputy project director for the FEA contract, claimed he accessed the program only to prove the laxness of security regarding the FEA system.

"I did not use it, read it or write it down and, when I had it all, I was going to take it to OSI in one bundle and show [OSI] what I'd done," he said.

"In my opinion, the situation rapidly got out of hand when [OSI] went to the level of bringing in federal involvement," he added. FBI agents were used to crack the case.

The charge of a lax security system for FEA data has been made before by the General Accounting Office (GAO). In a

(Continued on Page 2)

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DP Systems Affect – But Don't Benefit– The 'Ultimate User,' Non-DPer Charges

By Catherine Arnst
Of the CW Staff

NEW YORK – "Computers have done nothing to lift the burden of paperwork from individuals. In fact, computer technology has increased that burden and demoralized the individual citizen."

That remark was made by a non-DPer, Robert Ellis Smith, publisher of the *Privacy Journal*, during a recent conference here. He carried the banner for "the ultimate user – the consumer" and his battle cry was "technology to the people."

The needs of this "ultimate consumer" are rarely considered by DPers and manufacturers, which means consumers have not gotten their share of the "technological goodies" that have been developed, Smith said.

Instead, individuals spend a great deal of time on the paperwork necessary "to keep our own lives going," he said.

Personal Access Desired

What Smith would like is for individuals to have computerized access to the personal information maintained on them by computer systems. For a fee of 20 cents, one insurance company can get a record of another insurance company's experience with a policyholder within 30 minutes from the Medical Information Bureau (MIB) computer in New England, he noted, but "for me to get the same information, I must use the mails.

"There is an exchange of correspondence going on for months, a requirement that I waive my rights to sue for invasion of privacy and ultimately no assurance that I will ever see anything. After more than a year of trying, I still havn't seen anything, even though the MIB announces that it has a policy of disclosure," Smith said.

The National Crime Information Center, the Social Security Administration's computerized communications system, the Internal Revenue Service's computers and airline and railroad reservation systems were other examples Smith cited of systems used to keep tabs on the public without the public being able to use those systems for its own benefit.

"It's the organizers of people, the processors of people, who have control of computer technology. It's not the people themselves," Smith said.

The situation must be changed by demystifying the computer, he continued. This process can be accomplished by opening public computer centers and computer stores and starting newspapers oriented to non-DPers, thus fostering "the fun uses of the computer and household do-it-yourself uses."

Second, "we must open up computer data systems to the individuals who are named in them. The thrust of the Privacy Act of 1974 is as much to open up systems as it is to keep them more secure," he said.

"Just as we must take the mystery out of how the computer works, we must take the mystery out of the types of data the computer stores," he added.

Another method of opening up computers to consumers is to redirect and reduce the cost of computer/telecommunications technology so individuals can communicate quickly and cheaply, he said.

"Business and government are able to communicate more readily because of recent technological advances, but common citizens have found it more difficult and costly to communicate than a decade ago."

A bill has been introduced in Congress, H.R. 5323, which would allow the postal service to accept noncommercial messages for individuals and transmit them electronically to the addressee's post office for delivery in the next day's mail – an equivalent of the penny post card, Smith said.

Ex-Employee Charged in Theft

(Continued from Page 1)

report issued last July 15, that agency criticized the FEA's decision to award the contract to computerize classified data to OSI because the company's proposal did not meet security requirements, particularly in the area of protection against read access to the main memory, a GAO employee who worked on the report said.

There has been no official reaction from the FEA on the report, although OSI said it is changing the operating system for its twin IBM 370/168s from OS/MVT to VS2 Release 2 in order to improve security.

"But it's entirely possible that [Seidlitz] could have gotten the software package even with VS2," the GAO employee said.

OSI said there is nothing wrong with its security system and the proof of that is the fact that Seidlitz was apprehended before he took the entire program.

The unauthorized access was discovered Dec. 3 by OSI's monitoring techniques.

"The evidence showed no classified material had been stored in the OSI computer in a manner in which it could be obtained and no sensitive data or other FEA material relating to the nation's resources had been taken," according to Jerome Finney, the U.S. attorney who prosecuted the case.

Seidlitz's job at OSI put him in the position of implementing the FEA contract and he worked directly with OSI Wylbur, Moss said.

Seidlitz also heads his own computer services company, ABC Data Corp., a fact which he said was known to OSI when he was hired. The two companies are in no way competitive, he added.

During the trial, OSI officials testified Seidlitz was asked to leave the firm because he was using the computer for his own personal affairs, but he claimed that charge was "completely false" and he left of his own volition.

Stanford Asked for Information

After the indictments were handed down, Seidlitz wrote three letters to Stanford University, where the original Wylbur system was designed, asking for information on its availability, source codes and documentation.

In these letters, he expressed the desire to develop a Wylbur program for a DOS environment for his own company and asked for information on whether OSI had Wylbur and how it obtained it.

He did not identify himself as a former employee of OSI, nor did he mention the crime with which he had been charged.

The original Wylbur program was at one time available free from Stanford, but is no longer available to commercial users.

OSI Wylbur was based on Stanford's Wylbur, but OSI spent approximately $100,000 modifying it, Moss said.

On the Inside This Week

NEWS

Move to Electronic Banking Visible at ABA Meeting 4
SSI Program 'Almost Unadministerable': SSA Official 5
Problem-Specific Privacy Laws Seen Needed 7
Rose Cites Need for Congress to Make Policy on DP 8
HIS Planning Migration Option for Xerox CP-V Users 12
Users Urged to Recognize Full Scope of Data Security . . .13
Benton Says EFT Commission Planning Total Inquiry 14
Insurance Firms Seen Invading Privacy 15

EDITORIAL

Editorial: Independent Study Needed 18
White Hat, Black Hat: Japan III 19
Taylor Report: Training Could Prevent Tragedies 19
Someday Smithsonian May Hold Non-Bell Memorabilia . .20

SOFTWARE & SERVICES

'Trend Analysis' Package Pulls Data From IMS Base 21
Financial Models, Report Generation Run on Cybernet . . .22
Data Errors Can and Must Be Controlled, Users Told 23
Structured System Design More Vital Than Language 25

COMMUNICATIONS

First Memorex 1377 User Reports Units Working Fine . . .26
Front End Eases Processing Load for CPU in NBS Net . . .27
Public, Private Nets Seen Vying for European Users 29

SYSTEMS & PERIPHERALS

Public DP Access More Than a Concept 31
Tapes Play Double Role for Cost-Conscious State Office . .32
System Collects Data on Test Flights 33
System Helps Keep Cash Flowing for Water Department . .34

MINIWORLD

Minis Cut Emergency Response Time of Boston Police . . .35
Mini Maker as Single Source Called Users' Best Bet 36

COMPUTER INDUSTRY

Disk Drive Vendors Adding Larger Units 37
Adapso Urges Private Sector Role in EFTS 37
IBM Operating System Unbundling Seen User Benefit 38
IBM Results 'Continued to Be Good' Through May 39
Service Bureau President, Vice-President Killed 40
Second Fortune 500 Bruised Badly by '75 Recession 41
Basic Timesharing Expects to Double Base in 1976 42
Brazilian Firm Threatens to Sue Cincom 43
1980 Mass Memory Mart Predicted at $2 Billion 44

FINANCIAL

Ampex Has 'Significantly Successful Year' 56
MDS Year Shows Profit for First Time Since '70 56

In Watch for Banned Substances

Minis Ready to Run in Olympic Drug Control Program

By Esther Surden

Of the CW Staff

MONTREAL – Minicomputer systems at a laboratory here will be working overtime this summer to assure athletes competing in the Olympic games haven't taken any banned drugs.

A drug control program carried out by the Biomolecular-Analysis Center of the University of Quebec's Institut National de la Recherche Scientifique (INRS) will process about 3,000 urine samples during the July games, according to Dr. Robert Dugal, an associate professor at INRS and director of the program.

The INRS was given the mandate to beef up its laboratory operation in 1972 in preparation for the 1976 games.

"Since the INRS was selected by the International Olympic Committee's medical commission to carry out the program, our prime concern has been to develop a sensitive system," Dugal said.

The first organized drug testing of athletes was held during the 1968 Winter Olympics at Grenoble, France, and has continued since then, Dugal said. By 1972 only 12 of the more than 2,000 urine samples tested contained banned drugs.

The laboratory uses two Hewlett-Packard (HP) 2100-based lab automation systems to control 12 gas chromatographs and two gas chromatograph/mass spectrometers (GC/MS). They will monitor 12,000 athletes from 131 countries.

Half of the chemical analysis equipment is on loan from HP for the duration of the Olympic games, the vendor said.

HP equipment was selected for the lab because at the time "there were few choices of integrated systems," Dugal said.

System Recognizes 200 Drugs

The two lab automation systems collect and evaluate real-time data generated by the 12 gas chromatographs. Gas chromatographs separate chemical compounds in a sample into identifiable components.

The systems are programmed to recognize the almost 200 kinds of prohibited drugs by comparing incoming signals with internally stored values.

All functions – from the automatic injection of samples to the final production of an analytical report – are controlled by the system. Hardware includes 32K minicomputers, data terminal, paper tape reader and system console.

When the presence of a banned drug is recognized, the sample is run on one of the two GC/MS systems for positive identification. About 10% of all samples reach this stage because the system responds to the presence of nicotine, which may hide banned drugs, Dugal explained.

The GC/MS systems also use HP minicomputers. The spectrometer portion detects which compounds are present in the sample.

Both the laboratory automation systems and the GC/MS systems have identical disk-resident data on known prohibited substances. That data is compared with newly acquired data for positive drug identification, he said.

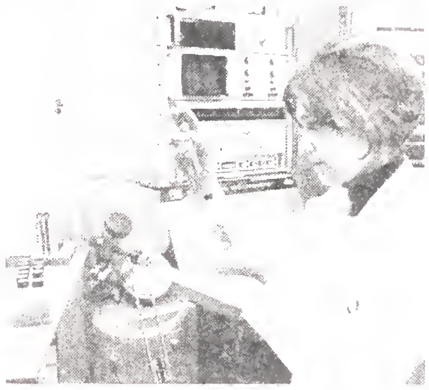
"Actual biological samples, obtained from individuals known to have taken drugs, were processed to give us actual qualitative and quantitative results," Dr. Michel Bertrand, deputy director of the program, explained.

The results, stored in the system's data libraries, are used to reference the identification of drug traces in samples, he said.

"The acquisition of that data was an essential part of our preparation to bring our mass screening operation under computer control," Bertrand noted.

The screening system catches all banned drugs and any compounds related to those drugs. If an over-the-counter cold remedy contains a compound related to a banned substance, that will be caught by the system as well, he said.

The laboratory contains about $250,000 worth of computerized equipment, Dugal said.



INRS lab assistant draws sample for analysis on a mini-based GC/MS system.

Voltage Dip Brings N.Y. Systems Down

(Continued from Page 1)

The disturbances are "a great inconvenience" because all the large New York City banks are tied into one message-switching network. Even though these institutions can keep on processing because they have UPS, the Federal Reserve Bank would go down because it has no UPS, Blumer said.

A UPS is the most expensive and fullest way to go – "it's the Cadillac of electrical power systems," he said.

But the system the bank is now considering is an interruptible power supply (IPS), he said, because it "levels out the peaks and valleys." It is all the bank really needs, he added, citing the high costs of a UPS.

The first voltage dip in early May was systemwide, a Con Ed spokesman said, but added "it was over in the blink of an eye." Secondary underground cables were switched in immediately to provide service to the utility's subscribers.

When asked about Con Ed's policy on this type of thing, the spokesman said users "operate any equipment at their own risk." The Public Utilities Commission does not expect or require Con Ed to provide "perfect" service, he added.

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JCL errors have also been markedly reduced. Instead of filling out lengthy JCL cards, keypunching and waiting up to four hours to get cards into the system, the programmer just sits at a ROSCOE supported remote terminal and keys in requested information shown on the CRT display. JCL is in the system in three minutes or less. If an error is made, the programmer knows about it immediately and can correct it on the spot.

ROSCOE's direct access conversational data entry features give the sequence of information that is needed automatically. What's more, the information goes directly to the system without stops and delays usually associated with manual data entry.

Joe Dupon, Manager of Computer Technology, credits these features with many dramatic savings in time and increases in efficiency through reduced coding and programmer keying time, reduction of manual operations, less waiting for data entry, fewer chances for error, and reduction of error correction time.

Other ADR software that Leeds & Northrup has installed includes The Librarian® and MetaCOBOL®.

The Librarian safeguards the maintenance and retrieval of application programs. MetaCOBOL was used to convert from DOS ANS Cobol to OS ANS Cobol in less than half the time Joe Dupon estimated it would take.

According to Joe Dupon, "an important point about ADR's software products—ROSCOE™, LIBRARIAN and MetaCOBOL—is that they have always worked to specifications. The program packages that have been shipped to us have had a virtual zero defect level. As a result, we have never hesitated to put them to work in our system without the lengthy trial and test procedures we normally use with other products."

For more information on what ADR software can do for you, call or write Applied Data Research, Inc., Route 206 Center, Princeton, New Jersey 08540. Phone: 609-924-9100

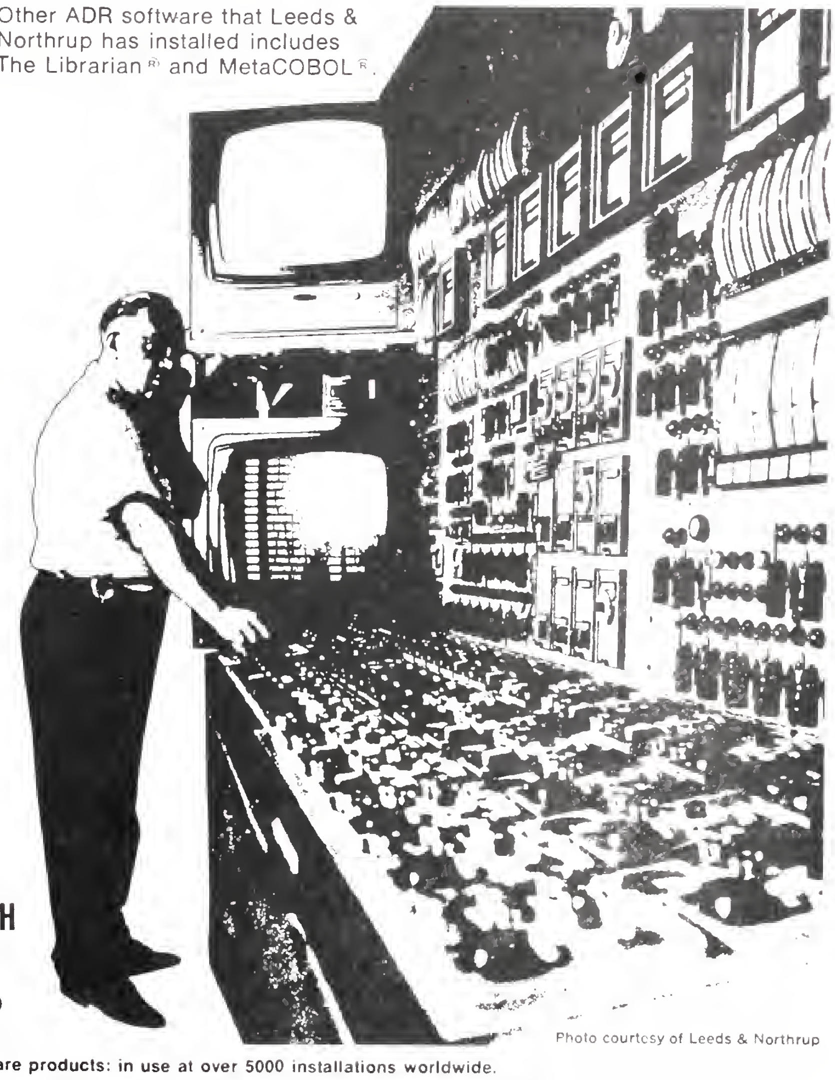

Photo courtesy of Leeds & Northrup

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CDC, Incoterm, NCR Products Bow

Move to Electronic Banking Visible in Vendor Unveilings

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. The continuing move toward electronic banking and electronic funds transfer was clearly evident in the major product announcements made at the recent American Bankers Association (ABA) National Operations and Automation Conference here.

Control Data Corp., for example, introduced Telemoney, a nationwide communications, software and support service it expects to offer banks so they, in turn, can offer the capabilities to merchants in their areas.

Incoterm Corp. announced its Series 7700 banking terminals which, a spokesman claimed, are "human-engineered" to encourage use by bank customers. And NCR introduced its mini-based 7750 Distributive Document Processing System which it said handles "most of the work in a bank's proof, sorting and reject/reentry departments."

Initial facilities offered under CDC's Telemoney, expected to be available later this year, are credit-card authorization, a check verification or guarantee service and a limited cash-card funds transfer service.

A more complete cash-card service, including local and national interchange and settlement information, is planned for late next year, CDC said.

CW
At ABA

Telemoney will provide linkages between local terminals and, eventually, both Cybernet and Service Bureau Co. data centers within CDC, various credit card systems – Bankamericard and Master Charge, for example – and check authorization services, a spokesman said.

The CPU of the bank offering Telemoney to its merchant customers may also be hooked into the system, he added.

Triple Incoterm Offering

Three elements in Incoterm's 7700 line were introduced. The AT4 Customer Transaction Facility counter-top unit, activated by a magnetic stripe card, was designed to be used for account transfers, electronic payments, balance inquiries, "most of the clerical work" for cash withdrawals and special functions, Incoterm said.

The AT8 Cash Delivery Facility was designed to operate as a rapid cashback device when used with a cluster of AT4s or as a stand-alone cash dispenser.

The AT11 is a "through-the-wall" unit that combines the capabilities of the AT4 and AT8 and is intended for 24-hour service outside the bank lobby, a spokesman said.

Incoterm Series 7700 AT4

In a typical lobby situation, the cost of an Incoterm 7700 system including several AT4s, an AT8 and related hardware would be about $7,500 per AT4 station, the vendor estimated.

Meanwhile, in its back-office setting, the NCR 7750 can control as many as eight operator workstations and a range of peripheral equipment, according to the company.

The system reads documents encoded in magnetic ink character recognition (Micr) and validates the data under user-defined software control. It can capture the good data on any of several magnetic media including tape, cassettes or disk or transmit directly to a host computer for further processing, according to NCR.

Software for the system provides user control of data validation, arithmetic processing, sorting and data capture decisions; applications software for processing consolidated cash letters and remote batch communications software for binary synchronous line protocol is also available, NCR said.

In addition to the specialized software, the mini accommodates general-purpose operations under NCR Century 101 simulation or under the Interactive Multiprogramming Operating System (Imos).

The purchase price for a one-station basic system including a 64K processor, I/O writer, two magnetic tape cassette units, the operator station and a four-pocket module is $38,435. The monthly rental is $1,115.

An eight-station system including 12 distribution pockets per station, a 128K processor, 9.8M-byte disk unit and 300 line/min printer costs $336,655 or $9,510/mo under a one-year rental agreement.

Read Encode/Capture/Proof/Sort (Recaps-I) software has an installation cost of $4,840 and a monthly license fee of $75.

Pomp and Protest Create Unusual Meeting Mood

By a CW Staff Writer

WASHINGTON, D.C. Protest and confusion on the one hand and pomp and circumstances on the other were the contrasting moods created by the appearance of two very different groups at the American Bankers Association's (ABA) recent National Operations and Automation Conference here.

Rumors that "poor people from all over the country" were going to demonstrate turned to fact the first afternoon of the conference when several hundred men, women and children – estimates varied widely on the actual number – swarmed into the meeting areas chanting against "red-lining."

Red-lining is the practice some banks are said to employ to rule out mortgage money for homes inside certain areas of major cities, marked off traditionally on the banks' maps with red lines.

The chanting became so insistent – and long rolls of red crepe paper or tape so pervasive – that discussion leaders in the technical sessions asked their audiences to stay close to the meeting rooms "until the trouble could be taken care of."

'We Want Dewey'

The rhythmic chant, "We want Dewey now" – referring to ABA's president, J. Rex Dewey – finally got results, however. Rex Morthland, the association's past president, attorney Terrance Klasby from the ABA's government relations task force and Bruce Rider of the association's headquarters staff agreed to meet with the National Peoples Action outside the hotel.

The meeting, however, was ineffectual, according to Rider, for two reasons.

Rider and his colleagues had no authority to make any agreement with the protesters and, in any case, the commercial banks represented by ABA "really have very little to do in the home mortgage area."

Beyond that, the operations and DP personnel at this conference were generally technicians and not policymakers, he added.

Seeming to confirm Rider's assessment, one banker turned to a friend after hearing the chants and asked, apparently sincerely, "What the heck is 'red-lining' anyway?"

Well-Planned Appearance

In sharp contrast with the afternoon's unscheduled events, the association's reception that evening included the well-planned appearance of another outside group, smaller in number than the protesters but still more than a hundred strong.

Three-quarters of an hour after the reception started, the high school marching band from Damascus, Md., trooped into the ballroom in green and white uniform playing everything from piccolos to tubas and bass drums.

The four bands already in place – one in each corner of the ballroom – kept their peace as the Damascus group played a medley of four patriotic songs and then retired from the scene.

The high school band director's only regret seemed to be that he didn't have his full band since 30 or more seniors had graduated; he could muster only 110 musicians for the ABA.

In the Spirit of '76

WASHINGTON, D.C. – It was almost bound to happen.

In this grand and glorious patriotic year. At a meeting of the American Bankers Association (ABA). And especially when the customer was the Bank of America.

And so it was that Bunker Ramo took the opportunity, at the recent ABA National Operations and Automation Conference here, to present the 1,776th terminal it had built for the bank to Hugh Dougherty of the bank's staff.

But one must understand there was a little time between the day the terminal came down Bunker Ramo's production line and the day it was given to Dougherty. After all, the builder realized it couldn't be just any common ordinary terminal for such an occasion.

Mechanically there was no difference between the presentation unit and the now more than 2,000 terminals Bunker Ramo has built for the bank – unless gold-plated keys instead of the usual plastic ones count as a mechanical change.

Beyond that, however, Bunker Ramo's artists did themselves proud. They painted red and white stripes – each about an inch wide – on the back of the unit. And painted the front flag blue. Then added a circle of white stars on the blue, with Bunker Ramo's name inside the circle.

Unable to resist the final touch, the vendor christened the showpiece the "Bicenterminal."

Correction

The upper- and lower-case printing feature described in "IBM System 32 Gets Word Processing" [CW, June 14] is available for $170 on a purchase-only basis.

erisa

PL93-406 demands accumulation of compensated and non-compensated hours affecting employees' pension.

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If yours is included you could find a quick remedy with a letter to Joe Nestor, Wang Laboratories, Inc., Tewksbury, Mass. 01876 or a call to (617) 851-4111. In California call Carl Tarascio (714) 631-0138. PL93-406 became effective January 1 so you don't have much time left.

WANG

SSI Program 'Almost Unadministerable': SSA Official

By John P. Hebert
Of the CW Staff

NEW YORK – The Social Security Administration's (SSA) Supplemental Security Income (SSI) program is a "sophisticated, complex and almost unadministerable system," in the words of the SSA's associate commissioner of management and administration.

Laws establishing the SSI program were passed by Congress in October 1972 and called for the program to be operational by January 1974. This left a 14-month period for the conversion of 1,350 computer programs, according to Frank D. DeGeorge.

Not only did Congress give the agency only 14 months to implement a 36-month program, but laws governing SSI payments were amended first in July 1973 and again the following December – one month before the system went live, DeGeorge said.

The laws involved the conversion of funding about three million people from the state to federal level of responsibility, DeGeorge remarked at a recent conference here.

The SSA developed a computer and communications input system to handle the new programs and a system of about 1,350 interactive terminals located throughout the U.S. was planned to handle the increased workload.

With about 1,000 terminals up, the first "test" of the system came in January 1974, when the system went live. "There were no alternatives," he said.

Hard to Administer

Problems with the system are manifold, including eligibility determinations on an error-prone quarterly rather than monthly basis, DeGeorge said. Recipients not reporting on time, if at all, or reporting erroneous information and the fact that all people under the SSI program are paid different amounts are also major problems, he said.

"The Federal government has picked up the cost of administration" of a system serving about 4.5 million recipients to date, he noted.

The SSI check is made up of three elements: a state mandatory payment, a federal maximum payment and an optional payment made by the state beyond those amounts, DeGeorge explained.

All the people, variables and options create a divergence away from a flat-rate program, making it difficult to administer the SSI program, he added.

In addition, about 300,000 people who signed up for the program had no identifying Social Security numbers and a half million people received payments based on arbitrary decisions. The agency had to assume the worst-case situation because of a lack of information and paid these people the largest possible amount, he explained.

Meanwhile, overpayments were being made at the same time another SSA computer (there are 100 computers in the SSA) knew the recipients had already been paid, he said.

"The federal administration should make payments based only on a uniform basis; it should be a flat rate. If there is a need to pay the recipients more, let the states add the extra amount," DeGeorge said.

Bill Vaughn, a congressional aide on the Oversight Subcommittee of the House Ways and Means Committee, commented "there is an unreasonable expectation of what the computer can do."

"Dec. 31 [1973] was the date for the last welfare change, which was a few days before the system went into operation.

"There is a communications gap between laymen and the computer experts," Vaughn continued. "Computers and their capability should not be oversold."

"The present welfare system is not only serious it's scandalous," Harvey Cruver of Managerial Controls, Inc., said. "The changes that constantly have to be made are enormous, just for the eligibility rules."

Cruver said the error costs are more than $1.7 billion and the administrative costs total about $1.2 billion.

"That's scandalous. About $1 out of every $3.95 goes to administration" of the Aid to Families with Dependent Children (AFDC) program, which includes about 11.7 million recipients, he said.

Larry Dooling of AT&T suggested focusing on the error rate problem in the AFDC program.

"The errors are usually caused by caseworkers at the program offices when the recipient is there," he said, citing a 53 redundancy of information entered.

This redundancy is a case for automation, he said and Norman Davis of American Data Systems agreed.

Three areas where Davis thought automation could help out dollarwise in welfare management are in income maintenance systems; in the Medicaid Management Information System (MMIS) and its six subsystems, and in the realm of social service

The problems with the welfare system, he said, are political. There are constant changes with the system and the agency is "just trying to keep its head above water."

Top-Secret Data Base Left for Viet Reds

CHICAGO – A prize piece of booty captured by the North Vietnamese Communists in their takeover of Saigon on April 30, 1975, was an IBM computer complete with a top-secret data base, according to a recent *Chicago Daily News* item.

The file included the names and records of more than 1 million members of the South Vietnamese armed forces, according to a serialized account of the fall of South Vietnam by Gen. Van Tien Dung, North Vietnam's top field commander.

Dung confirmed that highly classified intelligence data fell into the hands of the Communists when South Vietnam collapsed. Besides the military personnel listed in the data base, there were also files on policemen, agents, double agents and other members of the Saigon government's security apparatus.

IBM officials said they had no control over the computers which were left behind, according to the *News* report, and that there was nothing secret about the hardware since the same models are sold to the Soviet Union. Only the data was top-secret, they said.

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A "plug-in" data entry system is only one of TASK/MASTER's many advantages. Others include the ability to write on-line application programs in any language, ease of system use and maintenance, superior restart and recovery facilities, reduced storage requirements, and support for most terminal types and database management systems.

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IBM Introduces Top-of-Line 3/15, System 32 Models

(Continued from Page 1)

der CCP costs $16/mo, it noted.

The 15D can accommodate 160K, 192K, 224K or 256K bytes of main memory, the same as available for the 15C.

Disk storage has been expanded to allow accommodation of one of four possible disk configurations, the largest of which can have 506M bytes of disk. This is more than 2-1/2 times the disk available to Model 15 users previously, IBM said.

Disks can be 3340-A2, with two spindles using a removable 3348 Model 70 data module and accommodating 101.2M bytes; the 3340-A2 and 3340-B1 for three spindles with 146M bytes; the 3340-A2 plus a 3340-B2 for four spindles with 192.6M bytes, and the 3340-A2 plus a 3344-B2 for four spindles with a combined total of 506M bytes.

The 15D has a faster instruction fetch time for certain non-I/O instructions to complement the requirements of programming support, IBM said. No noticeable improvement in total throughput will be apparent to the user; also no degradation in response time should occur with the enhanced programming techniques, the firm said.

Current Model 15Cs can be upgraded in the field to the 15D, a spokesman noted. An upgrade from a Model 15C processor with 160K to a 15D with the same amount of memory would cost $7,440, he said.

The 15D will cost from $127,740 to $143,940, IBM said; rental costs are from $3,429/mo to $4,054/mo under the Monthly Availability Charge (MAC) or from $3,266/mo to $3,861/mo under the Term Availability Plan (TAP). First shipments will be in December, the firm said.

System 32 Models

The low-end models of the System 32 are intended for first-time users or users with remote applications in situations where less function may be required, IBM said.

Disk capacity has been downgraded to 3.2M bytes compared with 5M bytes for the lowest model previously available. A unidirectional printer with a 40 char./sec speed also reduces the capabilities of the system.

The System 32 A01 with the 40 char./sec unidirectional printer and 3.2M bytes of disk costs $33,560 or $680/mo on the TAP and $714/mo to rent. A middle-capacity A21 with an 80 char./sec bidirectional printer, 3.2M bytes of disk costs $34,020 or $771/mo on the TAP or $809/mo on MAC.

Disk capacity can be as high as 13.7M bytes for the A04, and printer speeds of 155 line/min are accommodated on the Model B31.

Not all IAPs can be run on the low-end System 32 models, a spokesman said.

A group of application programs for medical groups called the Medical Group Management System are designed to handle patient billing, accounts receivable, insurance claims and statistical data for practice analysis.

The user can prepare charge slips, statements, accounts receivable reports, revenue analysis, diagnostic and procedure analyses and insurance claims. The programs are available for an initial charge of $1,250 with a monthly license charge of $64 and will be available in October.

An IAP designed to improve financial controls for distributors, the Distribution Financial Accounting System (DFAS) includes three sets of programs that assist in controlling costs, paperwork and in planning general ledger, accounts payable and payroll applications, the firm said.

The general ledger module costs $405 initially with an $18 monthly license fee; the accounts payable module is $405 as well with the monthly $18 fee; and the payroll module is $515 initially and $23/mo thereafter. DFAS will be available in September.

IBM's General Systems Division can be reached at P.O. Box 2150, Atlanta, Ga. 30301.

Colo. Insurers Named In Theft of Records

(Continued from Page 1)

Tooley described a real case in which a construction worker was seriously injured on the job.

The worker filed a claim with his insurance company. The insurance company or its attorney hired one of these medical investigators to obtain the medical record illegally. Contained in that record was information about an earlier treatment for venereal disease, Tooley said.

"You can see how useful that sort of information might be in urging someone to settle his claim," Tooley said.

Jury Issues Recommendations

Along with its first round of indictments, the grand jury released a set of recommendations aimed at correcting the medical records confidentiality problem.

The first two recommendations called for strengthening the Privacy Act of 1974 to make it a felony to seize patient records where the value of medical services provided or the sale of the records themselves exceed $200.

Second, it recommended the Privacy Protection Study Commission, established by the Privacy Act, draw up a model act for states that would make disclosure of medical records a felony.

The insurance industry, through state insurance commissioners, should take strong disciplinary action against those who violate these principles. This could include voiding their right to do business where they have violated the law, the grand jury suggested.

Courts, as regulators of lawyers, should discipline attorneys who participate in these violations, it added.

The grand jury also called for tighter controls on medical records within hospitals. Records should be kept of all individuals who access a medical file and no access should be given without written authorization, the grand jury said.

Since 60% to 70% of such data is given out over the telephone, the grand jury proposed that hospitals develop a verification and callback procedure and enforce it.

Finally, "old" patient authorization forms should not be honored, the grand jury said. Recognizing this recommendation could cause some problems, the grand jury did not specify a time period beyond which authorizations should not be honored, leaving that responsibility to the insurance industry itself.

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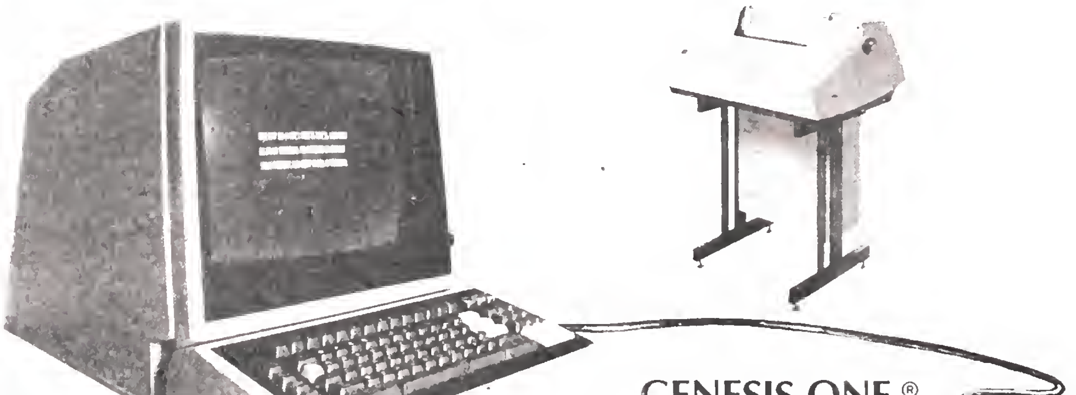

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Problem-Specific Privacy Laws Seen Needed by Private Sector

By Nancy French
Of the CW Staff

NEW YORK – Congress should concentrate on laws that address specific privacy problems rather than on an omnibus privacy law for the private sector, a panel of businessmen and attorneys said at a conference here recently.

No government agency is capable of interpreting and enforcing such a law and existing laws already give consumers recourse through the courts, they said.

A privacy law that restricts consumer reporting agencies from collecting information deprives consumers of the right to have their credit history passed on to another company from which they are seeking new benefits, according to A. Lee Lester of Equifax, Inc., formerly Retail Credit Corp.

The panel disputed the commonly held belief that business seeks to block individuals from credit and other benefits through investigations that turn up only the worst information.

At a time when half the business generated by a retailer such as Montgomery Ward is done on credit, "we don't want to turn credit-worthy customers away," Richard Cremer, who handles credit policy at that company, said.

Most consumers are not concerned with privacy; they just want to know that the information is correct, Lester said.

Questions for Congress

"Congress is going to have to answer a lot of hard policy questions before enacting a bill that requires business to collect and maintain only relevant and necessary information," according to Wright Andrews of Sutherland, Asbill and Brennan, the firm defending Equifax in the suit brought against it by the Federal Trade Commission [CW, Dec. 26-Jan. 2, 1974].

"How can an agency of the government tell [members of] the diverse business community what is relevant for each of them to collect?" Andrews asked. "What does it cost to collect only relevant information?"

Further, who is to decide if information is complete? he asked.

The privacy board or "federal information czar" most federal bills establish to write regulations that implement such a law could turn into a "Big Brother," he said.

On the provision in most privacy laws that calls for consumers to be notified when their personal information is used and disseminated, Andrews asked how that is to be done and how often.

If consumers are permitted to access their files and obtain copies, he added, how can this be done without centralized data banks that would create the very dossiers that privacy advocates are fighting?

Andrews also argued that if the names of third parties who provide credit investigators with information about their neighbors are disclosed to the consumer, "those sources will dry up."

Nuisance Suits a Possibility

Referring to the Privacy Act of 1974 as "the Lawyers Relief Act," Andrews said bills proposed to date give individuals broad rights for litigation and could result in a great many nuisance suits. Even programmers would be subject to personal liability, he said.

Furthermore, he asked, who should be required to pay the lawyers' fees – the company that violates the law or the consumer who brings the suit?

As for limiting use of the Social Security number, legislators should decide what their concern actually is. Are they troubled by use of the number itself or are they worried about using the Social Security number to link files? he asked.

As for discontinuance of the Social Security number, Andrews said it would actually cause business very little trouble since it is used largely as a "secondary checkpoint" to assure the correct identify of an individual in the case of similar names.

Mailing Lists Defended

Cremer also took the opportunity to defend sale of mailing lists for direct mail advertising.

Research conducted by A.C. Nielson indicated 75% of mail recipients open and examine direct mail they receive. Fifty percent use the coupons received, and 42% consider direct mail "useful," he said.

Further, two-thirds of the firms that use mailing lists are small companies earning less than $500,000 annually and employing fewer than 100 people, he said.

Privacy Laws Protect Civil Liberties: Higgs

NEW YORK – To describe as privacy laws those laws that protect individuals from misuse of their personal information is inadequate, according to Louis D. Higgs, deputy director of the Privacy Protection Study Commission.

The national Privacy Act of 1974 and the many laws passed by the states are actually fair information practices acts that protect civil liberties far beyond the scope of mere privacy, Higgs said here recently.

Broader Threats Posed

The threat posed by misuse of personal information is far broader than mere intrusion on a person's territory, he added.

Transferring profiles of persons without their consent nullifies their ability to "maintain control of their own lives. This is an equity problem," he explained.

Secondly, the inability to control the collected information "destroys peoples' abilities to overcome previous mistakes," he said.

Further, this type of activity "erodes one's autonomy and limits one's right to choose." It makes little difference if people have the right to buy insurance or obtain a credit card, for example, "if they are afraid to exercise that right," he said.

Basic Principle

Turning his attention to some of the common themes in fair information practices laws considered to date, Higgs explained that one of the basic principles involves "what say individuals have over information that pertains to them."

Thus, the basic provision all such laws contain is access to one's own file, he said.

Higgs compared this to the right to vote – "it assures your stake in society is protected," he said.

Pointing out that America is a "transactional society," Higgs said Americans make records of those transactions upon which the service delivery system depends.

"People apply for certain services and, on the basis of those applications, decisions are made. Then people conduct those transactions, and this produces the need to collect payments. More records are produced, and then someone audits these records," he explained.

Finally, those records are "aggregated and disaggregated" in planning for new transactions.

The Privacy Protection Study Commission, now one year old, is researching all these problems and will produce its final report for Congress on June 10, 1977.

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Says Problem Yet Unrealized

Rose Cites Need for Congress to Make Policy on DP

By Nancy French
Of the CW Staff

NEW YORK Selling Congress on the need to formulate public policy on information and computers is "like trying to pass zoning ordinances on the moon." Rep. Charles Rose said here recently.

"Not many members of Congress are even aware of the need for information policy or realize it's a problem yet," the North Carolina Democrat told a National Computer Conference plenary session on public policy and computers.

Rose was filling in for Rep. Wayne L. Hays who, he explained, was absent because of "unexpected bugs in his software.

"His hardware was also down," Rose added.

"The greatest challenge facing Congress today is making the legislature an effective overseer of the executive branch," Rose said, "and Congress is only beginning to give itself the kinds of tools it needs to do its job effectively.

"Not until Congress understands computer technology and the problems involved in that technology can we make the kind of national policy on information this country needs, and only then will Congress be an equal branch of the Federal government," he said.

Rose, who heads the House Administration Committee's Subcommittee on Computers, said he doesn't expect any reduction in the momentum of the subcommittee's activity if Hays should resign as committee chairman.

Hays, a strong supporter of the Computer Subcommittee's efforts, would probably be replaced by Rep. Frank Thompson Jr. (D.-N.J.), Rose said at a news conference following his formal presentation.

Important Steps

The 94th Congress has taken some important steps aimed at bringing computers to bear on the information explosion, and Rose hopes to do more, he said.

Creation of the House Administration Committee's Subcommittee on Computers was one, he said. A second was getting through a measure authorizing each member of Congress to spend $1,000/mo of his staff budget on computer services, including rental of terminals and time-sharing services.

"It would do your hearts good," he said, "to see your congressman carrying a portable computer terminal with an acoustic coupler built into it down to his district to bring himself up-to-date on issues over the weekend."

Using such a terminal, a member of Congress could dial a number at the Library of Congress and access information maintained on-line on the Library's Scorpio system, he said. Scorpio contains a digest of bills as well as over one million citations of articles on any number of subjects.

Rose also boosted his bill to computerize the catalog of federal grants – a list of federal programs that is presently published in a document three inches thick [CW, May 24]. A similar bill was introduced in the Senate by senators Edward Kennedy (D.-Mass.) and William V. Roth Jr. of Delaware.

About the federal grants catalog, Rose said "it takes a Philadelphia lawyer to understand it, and when he's through reading it he still doesn't know if there's any money left in any of the programs he's interested in, or even if his community is qualified for them."

The bill would require the Office of Management and Budget (OMB) to update the system regularly by line item so Congress can tell what funds have been spent, how much is still available at any given time, and whether federal agencies are complying with legislative intent in implementing their programs.

"OMB doesn't want to give up that kind of information and it's going to be a devil of a job getting [the President] to sign it," he said.

Rose said he is looking forward to the day when the Congressional Budget Office has a computerized fiscal budget system containing an inventory of money appropriated over the years. This will enable Congress to compare budget items with previous years before voting on a new budget.

Dr. Alice Rivlin, director of the Congressional Budget Office, is working on a system Rose anticipates will be operational by next January.

While Rose believes Congress should be doing more, he pointed out some information policy already on the books.

The Brooks Bill, passed in 1965 but not yet fully implemented even today, seeks to control the procurement and management of information-processing equipment in the Federal government.

The National Science and Technology Policy, Organization and Priorities Act of 1976 calls for a continuous appraisal of the role of science and technology in achieving goals.

The Copyrights and Revisions Act of 1974 authorized a National Commission on Copyrights which is studying the question of copyrighting computer programs as one part of its policy mission.

The Privacy Act of 1974 placed limits on the collection and use of personal information within the Federal government, he said, adding that misconceptions about this law unfortunately "outdistance the misconceptions about nuclear power by at least a factor of 10."

Bidding for DP Art Up

NEW YORK – Computer art at the "Dutch" or silent auction held at the National Computer Conference here recently drew bids ranging from a low of $15 to a high of $200, with many bidders paying twice the asking price.

The exhibition itself, billed as one of the largest international computer art shows to date, drew 2,000 visitors.

The works reflected the use of the computer as an intermediate device, with the final art forms reduced to fine art in varied media including etching, lithography, textile design and photography.

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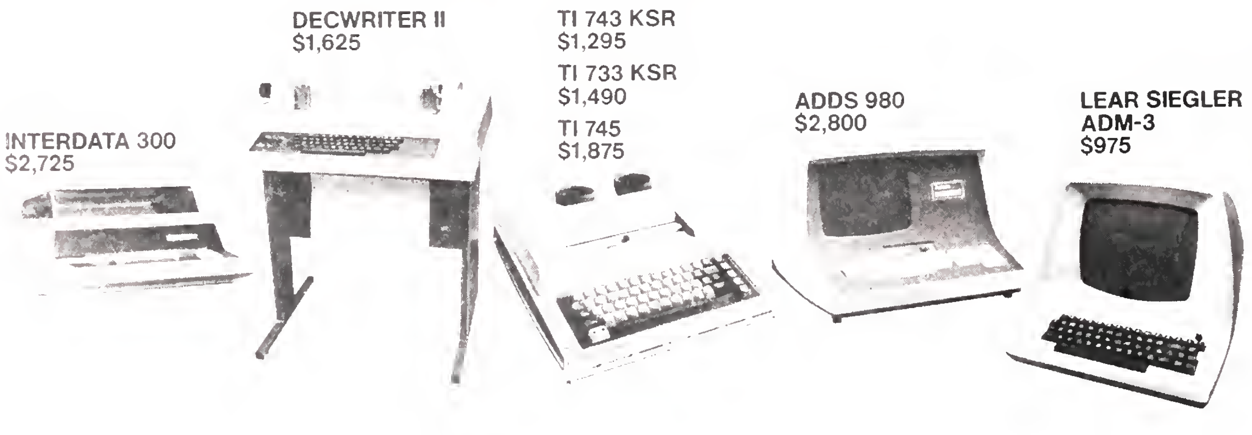

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Plan Scheduled for Late '78

HIS Planning Migration Option for Xerox CP-V Users

By Nancy French
Of the CW Staff

PHOENIX – Honeywell Information Systems (HIS) is working on a plan that will offer users of Xerox's CP-V operating system a migration path to an HIS system by late 1978.

The migration path will allow the CP-V user to convert to a "derivative" of HIS Series 60 level 66 system at about 30% to 35% of the effort needed to convert to another manufacturer's system, according to John Eschinger, vice-president of Exchange, the Xerox users group.

The official announcement of the plan was made at a recent Exchange meeting here by Lee L. Sheehan, vice-president and general manager of HIS' North American Computer Operations.

HIS agreed to assume responsibility for service and marketing support functions for Xerox users after Xerox announced its plans last year to leave the computer industry.

According to Eschinger, who is assistant director of academic services and computer systems at Bucknell University, the Honeywell offering is expected to be "price compatible."

As an intermediate step, HIS will offer a microprocessor-based controller interface to allow Sigma computer users running under CP-V to attach high-speed, high-density HIS peripherals to their systems by about 1977.

The highest density disk presently available from Xerox is 100M bytes, according to Eschinger, who has been working on the Honeywell-Xerox Users Committee to bring about the plan.

Until these HIS products are available, users will be depending on Xerox add-on memory presently being marketed by HIS, Eschinger said. Xerox add-on memory is "a major survival issue" because the average CP-V user site has been growing at the rate of 30% a year and the average CP-V user already has 128K of memory on his system, he added.

Eschinger also predicted that mean memory size will increase to 160K bytes of 32-bit word memory by 1978, so a migration path to a bigger and more powerful system is a top priority item for the Honeywell-Xerox team to work out.

About 120 users are presently running under the Xerox CP-V operating system.

HIS expects to announce the migration plan as a definite product as soon as specified performance levels are verified and user acceptability is determined, a spokesman said.

The plan has taken shape slowly because every decision has to satisfy HIS business needs as well as those of the users, Eschinger noted. "It's in our best interest that Honeywell stays profitable," he said.

The future is less clear, however, for Xerox's 275 real-time users and the few still running under BPM-BTM, the predecessor to CP-V on Sigma 5s. These users, who tend to be "more diversified," have not yet organized to articulate their needs to HIS management, Eschinger said.

Users who are running Sigma 5s cannot migrate to CP-V because they don't have memory map hardware or byte string manipulation capability, he said.

An HIS spokesman confirmed the mainframe is investigating the possibility of providing the necessary capability as a standard produce, but no decision has yet been made.

The CP-V migration plan calls for translating most of the processors that are running on the Sigma and the 500 series of the CP-V operating system. This would include APL and Fortran, he said.

"We are taking some processors from the Honeywell side of the house, including its data base management system and its Cobol, which is better than Xerox's, he said, "and obviously we're also going to require some conversion tools."

Most Xerox users greeted the HIS announcement with enthusiasm because "we have someplace to go now," Eschinger said.

However, they are not ready to embrace Honeywell's Gcos operating system "particularly because of the way it interfaces with the user," he said.

"If you create a file on-line, it's in Ascii code, whereas a file created in batch is octal," he said. Having a file system that's built in Ascii and computational system built in octal creates a certain amount of awkwardness, he explained.

Sheldon Klee and nearly 100 other former Xerox computer software development engineers have been hired to work on the project, the HIS spokesman said.

Users Urged to Recognize Full Scope of Data Security

By Toni Wiseman
Of the CW Staff

CHICAGO – There are three important things to bear in mind when considering the protection of data, Robert Courtney, director of data security and privacy for IBM, told attendees at a Computer Protection/Insurance seminar here recently.

The first thing to realize is there is a wide variety of things which can happen to data; therefore, a broad definition of data security must be formulated, he said.

The realization that data is a major corporate asset is the second tenet, and, last but not least, the user must accept the need for a completely rational, feasible risk assessment technique, he said.

The lack of any one of these elements will result in an ineffective data security system, Courtney said.

Data security systems are intended to guard against accidental or intentional disclosure, modification or destruction of data, he said.

"If we are going to attack our data security problems in a systematic and rational way, we must prioritize our problems."

Courtney outlined the six major data security hazards, with errors and omissions topping the list.

Dishonest employees and immediate past employees are the second most important hazard, he said. "It's a fact people rip off that part of the system they know best," Courtney said. "They don't cross boundaries."

This means an employee will generally abuse that part of the system he has already been granted entry to, so access control alone will not solve the problem. Rather, the solution is to be found in individual accountability, he said.

Third on the list of hazards is fire, Courtney said.

"Relatively few fires start in computers themselves," he said, "yet managers of DP facilities have a strong tendency to put fire-detection and fire-quenching equipment where the dollars are and not where the combustibles are."

Firms have an affinity for situating their computer rooms on top of cafeterias, usually right above the stoves, or under the cafeteria below the dishwashers, Courtney said.

Fire protection is important in areas where files, tapes and power sources are located as well as in the computer room since "even if your computer is still operating, it won't do you any good if your back-up files are gone or the communications lines are down."

Disgruntled Employee

Disgruntled employees are a fourth category, separate from dishonest employees, he noted.

These people don't have an economic grudge against the company and generally want their damage noticed.

"This type of damage does not occur often, but on a per-instance basis the economic impact is quite high," Courtney said.

He typified this hazard as the kind which arises when a programmer asks for help three times on a job he can't get to run and all he gets is a pat on the back from the manager and a word of encouragement. He then goes home, gets his 38 and shoots the computer.

This type of situation usually occurs over a long period of time, however, so a reasonably aware management should be able to notice its development and take preventive measures.

Broken water pipes which overflow through the overhead ceiling tower over natural disasters in terms of frequency and cost, he said. Yet $15 worth of polyethylene film and a pair of scissors can cure the problem by covering the box under the leak.

Strangers are the final hazard category. This is someone from outside the company, he said, such as a student from a computer school on an ego trip who wants to prove to his buddies he can get into the system, create a system crash and leave a message such as "This crash courtesy of the XYZ School of Engineering."

The economic and operational upset here is negligible, since these perpetrators don't seem capable of following through and making a dollar from their actions, he said.

If one can prioritize the hazards, then good solid quantitative risk assessment is the next step, Courtney said.

This consists of plotting on a graph all the data and physical holdings of the company against the various hazards which can impact them in terms of probable frequency of occurrence and economic impact.

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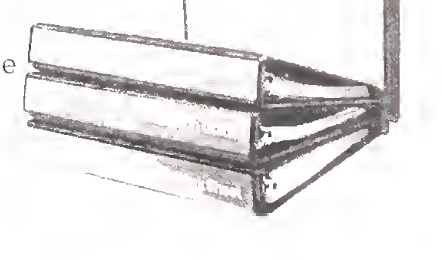

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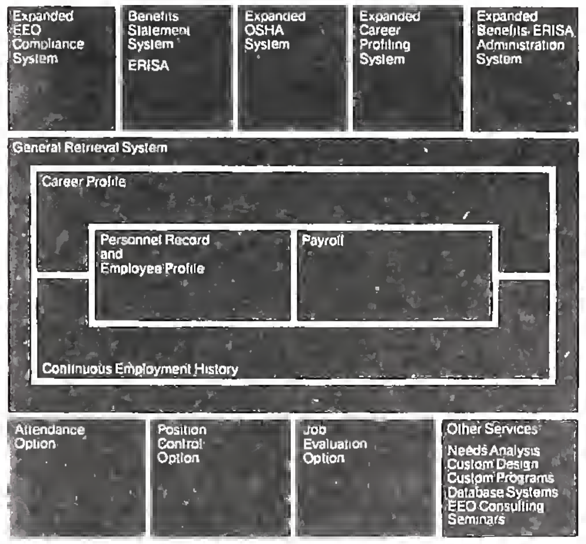

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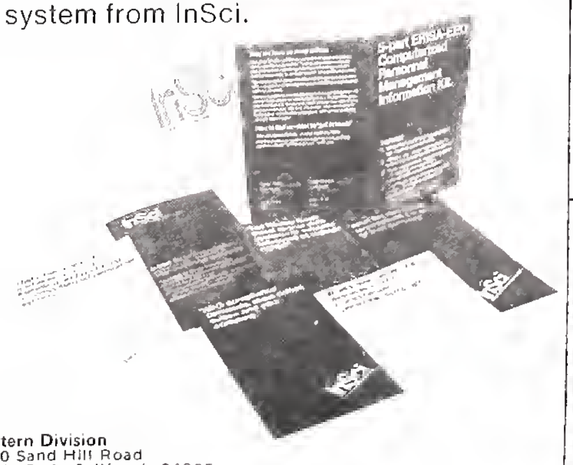

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Benton Says EFT Commission Planning Total Inquiry

By Tom Wiseman
Of the CW Staff

CHICAGO — The National Commission on Electronic Funds Transfer (EFT) is planning a thorough inquiry into the full range of concerns, both present and future, which stem from the expansion of EFT systems, John B. Benton told attendees of a Payment Systems Symposium here recently.

Benton is executive director of the commission, which was established last October to evaluate the likely consequences of alternative EFT systems in the years to come and to recommend appropriate administrative action or legislation.

While industry sources feared the commission would limit itself to investigating the market share aspect of EFT, Benton made it clear the commission's range of issues will be much broader and include the impact of EFT systems on competition, monetary policy, international implications, rights of privacy and consumer convenience.

Benton also called for participation and input from users, providers, suppliers and regulators of EFT systems, stating these individuals and bodies have "a profound responsibility to make expert contributions."

Commission Goals

In order to conduct a thorough investigation of EFT, the commission must study the basic concepts, assumptions and beliefs which underlie today's thinking on the subject, Benton said.

It must also identify the individual types of participants in EFT systems and understand how they relate to one another — how changes in the behavior of any one participant, whether they are imposed or market driven, can cause reverberations throughout the entire system of participants, he said.

"Finally, we must assess the impacts of the consequences of future EFT systems and of broad social changes, particularly as they might threaten the principles of capitalism, competitive markets, freedom of individual choice and social justice upon which our nation is based," he stated.

Toward this end, the commission has broken itself down into smaller working groups, four "committees of perspectives," to ensure no major policy issue is missed in its possible impact on users, provider, regulators and suppliers of EFT systems and services.

The commission has also developed a basic definition of EFT which it will seek to further elaborate in the coming months, Benton said. According to the definition, EFT is "a kind of payment system in which the processing and communications necessary to effect economic exchange, and the processing and communication necessary for the production and distribution of services incidental or related to economic exchange, are dependent wholly or in large part on the use of electronics."

Eight Investigations Set

The commission has established eight general categories which it will examine during its two-year charter.

The first category, use and control of EFT systems, involves the issue of which institutions, public or private, will or should own EFT systems or subsystems — a question which may or may not be entirely decided by free market interplay, Benton said.

A related issue is which institutions will or should have access to which EFT systems and subsystems and under what terms and conditions.

Both issues will require an examination of actual or possible regulatory mechanisms, not only to indicate how patterns of ownership and access may evolve, but also to provide insight into the types of regulatory changes that may be required by recommended alternative arrangements for ownership or access.

The second category of investigation involves national economic policy implications. "One major kind of economic policy tool, that of monetary policy, may be made less effective by the implementation of EFT. This could result in part because of the changing definition of 'money'," Benton said.

The commission also plans to make a comprehensive cost/benefit analysis of EFT from a national perspective because the costs of an EFT system and the related economies of scale will help determine the economic feasibility of competing EFT systems.

It is also important to understand how the costs of EFT systems will be allocated among users and providers of the systems, Benton noted.

The fourth category of investigation will cover the management of EFT information, including the use of personal financial information which may provide a descriptive record of an individual's life style and his political, economic and religious beliefs, Benton said.

Recordkeeping practices will also be covered by the commission because, as electronics technology assists or replaces paper in financial transactions, existing practices may be inappropriate for evidentiary purposes, he stated.

Sixth on the list of investigative areas is telecommunications. "A prime question is the demand which EFT would place on the nation's common carrier systems, which distribute a resource (telecommunications capacity) which is fixed, at least in the short run," Benton said.

"A related question is whether the emerging EFT market may possess such inherent economic strength that new businesses will emerge to provide EFT telecommunications systems," he added.

Technological factors will also come under commission investigation, including questions of integration and systems compatibility and of security.

Finally, the Commission plans to look at international developments to see if foreign experience with EFT capabilities or developmental program can be instructive in policy deliberations on actual or potential U.S. systems, Benton said.

The restructuring of financial institutions is not covered by any of these eight areas, he said, mainly because of the global relevance of that issue.

In addition, Benton said, he feels financial restructuring is more accurately viewed as a possible output of the commission's analysis and is miscast when categorized as a specific subject of analysis.

Safeguards Proposed

WASHINGTON, D.C. — The insurance industry should adopt safeguards to assure an individual does not sign away his right to privacy when he authorizes an insurance company to access his medical files, according to recent testimony here.

Benjamin Lipson, a Boston insurance agent, told the Privacy Protection Study Commission the following safeguards should be adopted:

- Blanket authorization forms should carry a time limit.
- Photocopying of authorization forms should be prohibited without specific informed consent.
- The consumer should be given a place to turn when there is reason to believe his privacy has been violated.
- Any remedies adopted should contain a provision that makes null and void within 90 days all outstanding previously granted authorizations.

Systems 'Unwitting Participants'

Insurance Firms Seen Invading Privacy

By Nancy French
Of the CW Staff

WASHINGTON, D.C. — Many Americans do not buy life insurance or take advantage of health insurance benefits they are entitled to because they fear invasions of privacy in which computers are "unwitting participants."

Many patients who use insurance plans to help pay for psychiatric counseling run the risk of losing their jobs because of the stigma attached to psychotherapy and the fact that claims are not kept confidential, psychiatrist Jerome S. Biegler told members of the Privacy Protection Study Commission here recently.

Biegler, who is chairman of the American Psychiatric Association (APA), was one of the witnesses heard by the commission at its hearings on information practices of the insurance industry.

Persons who have filed claims to help pay for treatment of venereal disease or a heart attack, for example, have found this information is disseminated without their authorization and, as a result, it is not uncommon to lose other seemingly unrelated privileges, APA's task force on confidentiality found.

A California physician who had a heart attack, for example, returned home after a complete recovery only to find his auto insurance had been canceled on the basis he was a poor risk, Biegler said.

'Open-Ended Intrusion'

When an individual applies for life insurance, he signs a form authorizing "any licensed physician, medical practitioner, hospital . . . insurance company . . . or other organization having any record or knowledge of the individual or his health to give to the insurance company any such information," according to Benjamin Lipson, a Boston insurance agent.

A photocopy of the signed authorization is considered as valid as the original, Lipson said.

This is an "open-ended intrusion" into an individual's personal life," he said. It has "no time limit" and allows insurance companies to go into individual's computerized records at the Medical Information Bureau time after time for information on health as well as non-health-related data such as sexual habits, drinking habits and hobbies.

Lipson specializes in getting life insurance policies for individuals who have been refused standardized coverage.

As a result, many people avoid getting policies or using their policies.

"A Maryland psychiatrist reported recently that between 1963 and 1975, patients of his having federal employees' health benefits with Blue Cross paid a total of $168,075 out of their own pockets for psychiatric care that otherwise would have been covered or defrayed by their insurance," Lipson said.

This is an especially difficult problem for people in the military, Biegler said.

Many young officers who have very complete insurance coverage under a program called Civilian Health and Medical Program for the Uniformed Services (Champus) would never file a claim because when those claims forms go back to their personnel offices and get into their files, their futures are jeopardized, he said.

Much of the privacy invasions engendered by the insurance industry are laid at the feet of the Medical Information Bureau, (MIB), an information clearinghouse that serves insurance companies.

Information in the MIB data bank is used by about 700 life insurance companies to help "flag" bad risks for life insurance coverage, according to Neal M. Day, MIB executive director and general counsel.

Over the years, MIB officials have emphasized that health data is not maintained in their files or used for "underwriting decisions."

However, during Day's questioning by the commission, it became apparent that in some cases such information is also used to make underwriting decisions.

If a life insurance company finds out that a year ago an individual had a health claim of some kind, that company is obliged to put that information in MIB not as health claim data but as underwriting information, Lipson said.

MIB attempts to enforce its standards through an on-site inspection program that involves looking at 20 randomly chosen files of each of its member companies per visit, Day said.

To date, 1,500 such files have been inspected, and only 40 to 50 files showed use of health claim data for making underwriting decisions, Day said.

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Machines Get Vote of Confidence for Calif. Primary

By Esther Surden

Of the CW Staff

SACRAMENTO, Calif. What do Jerry Brown and the computers in the Secretary of State's office here have in common?

They both performed admirably during this state's Presidential primary June 8.

When the last vote was cast in the primary, computers here tallied the results for the semiofficial canvass.

After the vote was tallied, the equipment used to count it was dismantled and returned to its vendors until a month before the next election.

"It must be a losing proposition for the vendors," George Boyd, DP manager, said.

Californians voted on about 500 candidates in 58 counties and 4,044 precincts, Boyd said. Offices up for grabs included President, U.S. senator, U.S. representative, half of the State Senate seats and the entire State Assembly.

The voters also were asked to decide on some 15 controversial state propositions, Boyd said.

All of the races were kept tracked by two IBM 370/168 mainframes at the Teale Data Center, reached via telephone lines and a Data 100 remote job entry terminal at the Secretary of State's office.

Teale acts as "my operations center," Boyd explained. It is a service bureau with responsibility to 38 other state agencies as well as the Secretary of State's office, he noted.

Beginning at 9 p.m. on election night, voting information was transmitted to the Secretary of State's office either over the telephone or, in the case of the state's six largest counties, via IBM 1050 data communications card-oriented systems.

For the balance of the counties, the 16-member election night data entry staff, along with five programmer/analysts sat at telephones in front of IBM 3270 displays and entered the data directly into the Data 100 batch system in the office.

The data was then transmitted to the IBM mainframe located across town over four 2,400 bit/sec half-duplex lines and one 9,600 bit/sec full-duplex line.

It took about 17 minutes for the vote to be transmitted from the six largest counties to the 370s. "The output these counties produced is literally machine-compatible with the state computer. The only reason we break it down to transmit cards is because it's safer, more foolproof and less costly than going computer-to-computer," Boyd said.

On the average, it takes about 25 minutes for the data entry staff to absorb one of the non-card-oriented county's reports and enter it into the computers in Sacramento, Boyd said.

Debut of CRTs

This primary marked the first time CRTs were used in an election in California at the state level, the brainchild of Rico Nannini, California assistant secretary of state, Boyd noted. The procedure went very well, he added.

Throughout the evening the Secretary of State's office took an average of seven reports per county and printed out hard-copy reports on the status of the voting.

"The information system we had was totally real-time at the state level; as the vote was accumulated by county, it was made immediately available to state officials and the press.

"They could make inquiries on the races to determine not only how many votes have been cast per candidate but also, in the case of the Democratic party, how the delegate races were going."

The system kept a running total of the delegate race in the Democratic primary since it was not a "winner-take-all" race, Boyd explained.

By 9:35 the morning following election day, all votes in California had been counted, Boyd said, and the semiofficial canvass had been produced.

"And when we produced it we printed it simultaneously in Sacramento and Los Angeles," he said. The state was "two hours closer to the counties" in this election, he said.

Using the Data 100 equipment, which includes a 600 line/min printer, the state printed 500,000 lines before it was finished processing, Boyd said, adding the printer was not designed for such use but held up well.

DPers Back at Work One Day After Fire

LAWRENCE, Mass. Despite a fire that ravaged the data entry equipment in the Massachusetts Department of Public Welfare's regional data control unit here recently, work proceeded as usual within one work day of the fire.

Cogar Corp.'s Brighton office was able to replace the hardware lost in the fire as well as the custom software used by the regional center, which processes the SS9A recipient payment program, a spokesman said.

The fire occurred Saturday, June 5, knocking out a Cogar 1500 processing system comprised of six 1501 intelligent terminals, one 125 line/min printer, a magnetic tape converter and various bisynchronous communications gear.

Cogar was notified of the loss on Monday and by Tuesday the regional data center was up and running, according to Val Azbedian, director of the program management office in Boston, who extended his personal thanks to Cogar Corp. for its quick work.

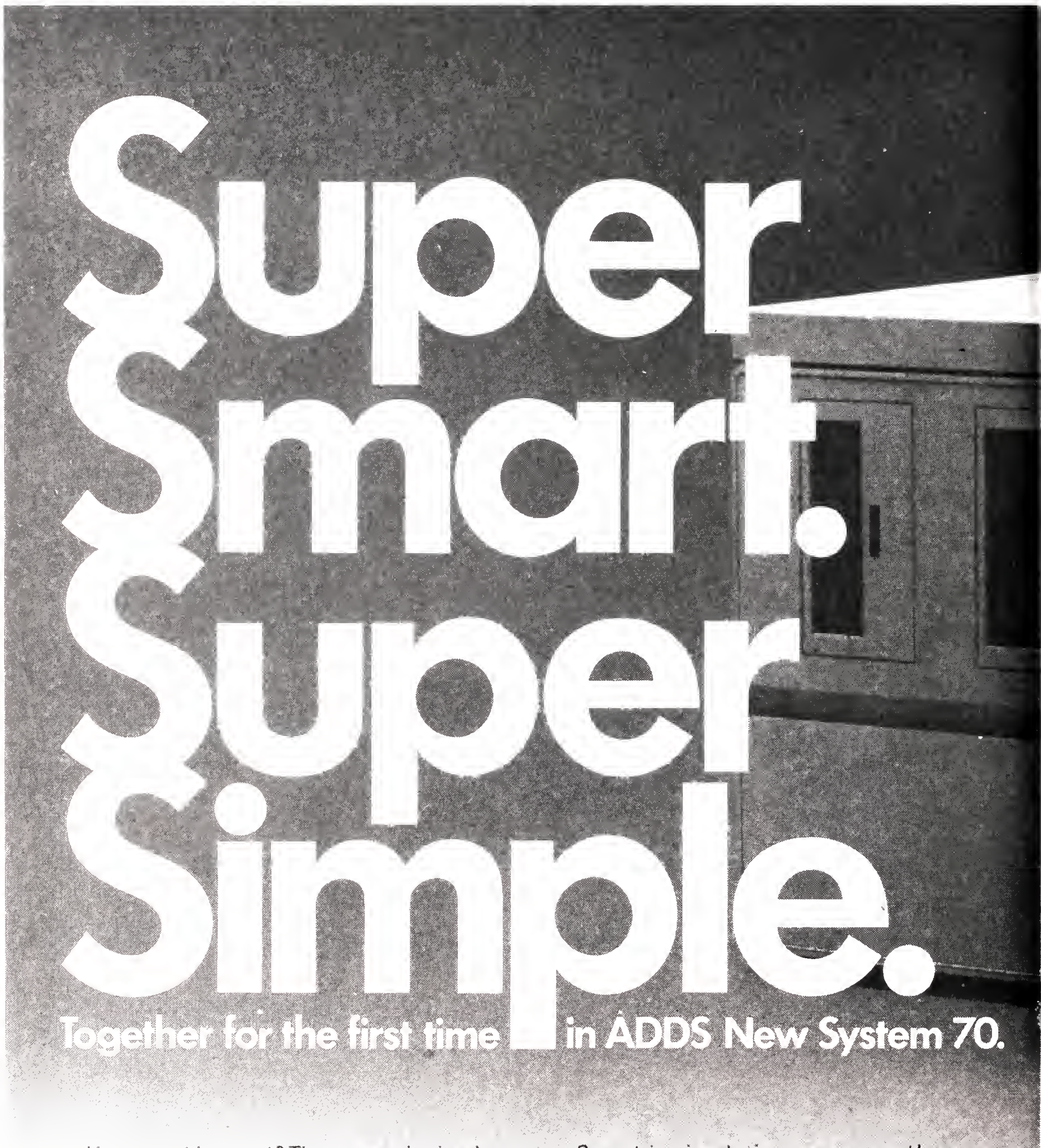
MIT Center Sets Seminar On Current Research Issues

CAMBRIDGE, Mass. "Current Issues in Information Systems Research" will be discussed at an Aug. 3-6 seminar here sponsored by MIT's Center for Information Systems Research.

The issues under consideration will include distributed processing, decision support systems, operating systems and new technologies, such as microprocessors.

Emphasis during the lecture/discussion sessions will be on management problems such as performance evaluation, configuration selection, privacy and security, information system effectiveness and implementation strategies, the MIT center said.

Tuition for the four-day seminar, which will be held on the MIT campus, is $450. Further information is available from C. Lawrence Meador, CISR, E53-311, Sloan School of Management, MIT, 50 Memorial Drive, Cambridge, Mass. 02139.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No One Solution Exists, Users Told

Management/DP Liaison Aided by Corporate Structure

By Molly Upton

Of the CW Staff

NEW YORK – There is no one solution to fit every DP department's problems of liaison with top management, but there are solutions, George Glaser told a session entitled "Executive Management Must Become Involved" at a conference here recently.

A survey conducted by Gopal Kapur, another speaker, and himself of 35 DP managers indicated a strong correlation between the effective method for a particular DP department and the manner in which the overall corporation was structured and administered, he said.

Both Kapur and Glaser stressed the need for good management within the DP department and also for corporate management to understand the inner workings of the DP department. Kapur and Glaser are consultants.

Perhaps it is not so much a question of having top management get its hands "dirty" with DP involvement and planning, but having a state where top management has already gotten its hands dirty with experience in the DP department, Kapur said.

This can be done through programs directed at corporate managers who are peers of the DP manager, i.e. middle management, or even earlier by rotating trainees through the DP department, he said.

DP a Pain in the Neck

All responsibility for planning DP solutions to corporate problems cannot be left to the DP technicians who do not see all the corporate needs, Kapur said.

For a large number of firms, the DP department is a pain in the neck or worse, he said. Chief executives are frustrated by their inability to understand the technological capabilities and manpower needs within the department.

To compound the situation, chief executives are often fed a line by the vendor that leads them to ask the impossible of the DP department, he said.

Many managers are either bitter by experience with the DP department, intimidated by the DP department or fed up, he said.

A DP manager should first of all be a good manager, and then a good technician, Kapur said. Rotating future DP managers through user departments would also be useful, he said.

The DP manager should be bilingual able to translate computerese to the management and advise and warn them.

On the other hand, the executive should ask about the pitfalls of any project or new system.

A key element in the success of any project undertaken by the DP department is acceptance of that project by the corporate user department or manager.

If a manager perceives a system as a threat to his status or job, then there's trouble, Kapur said.

However, if the department or manager accepts the idea and helps design it, the system has a much better chance of succeeding, he said.

Unsuccessful Methods

Among the methods found unsuccessful, they said, was to ignore the user department during the design of the system.

Other methods that have a low success rate include "music appreciation" courses, or seminars, and setting up steering committees without specific goals statted by people who often don't attend.

The seminars, designed to increase management's acquaintance with DP functions, average 2.5 days of "music appreciation" and generally represent a bombardment of DP jargon, Kapur said.

Glaser urged DP departments to recognize their needs, such as financial support, for what they are, rather than wrap them into the term "involvement."

For management to become involved, the DP department has to do things in return, he said. Only if a DP manager's peers and superiors think he is a winner will he get support, Glaser said.

More critical than reporting to the president of the company is reporting to a capable, effective manager, Glaser said.

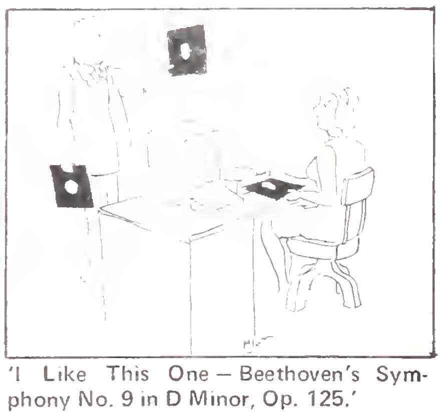
The use of a committee works well if it fits with the organizational philosophy, he said, citing one installation where monthly meetings were held with agendas circulated well in advance for comments. The participants at these meetings, run by a former Marine colonel, were very well prepared, he said.

The efficacy of long-range planning also depends on its consistency with overall corporate style of management, he said. However, a five-year plan can be used by the DP manager to weather management changes.

There were also various styles of personal liaison with users that proved effective, he said

For instance, some DP managers met the user departments at monthly meetings or planned lunches with users. Others modeled the internal DP structure so it was nearly identical with that of the corporation, which resulted in the user departments interacting with a specific group of people within DP.

The job of DP director, Kapur said, is so large that often installations have two people, one as director, who reports to corporate management and is responsible for long-range, overall plans, and the other the DP manager, who is thus freed to fight the fires of day-to-day concerns.



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Editorial

Independent Study Needed

The fiasco at the Social Security Administration's (SSA) DP operation continues to unfold.

While it is clear the organization uses its computer systems less than 50% of the time, the administration still is pressing for a new facility [CW, June 21] and is planning to take delivery on two IBM 370/168s that are currently in storage and for which the SSA has no room.

At the same time SSA apparently is trying to hold up a report prepared by the General Accounting Office that clearly outlined the underutilization of DP facilities. (*Computerworld* incorrectly reported last week that the report was available – it can be obtained only by selected congressmen.)

That report should be made available immediately so interested DP professionals and others can study and understand the magnitude of the problems at SSA – and possibly help to suggest solutions to the problems.

This could be an excellent function for the year-old Washington, D.C., office of the American Federation of Information Processing Societies (Afips).

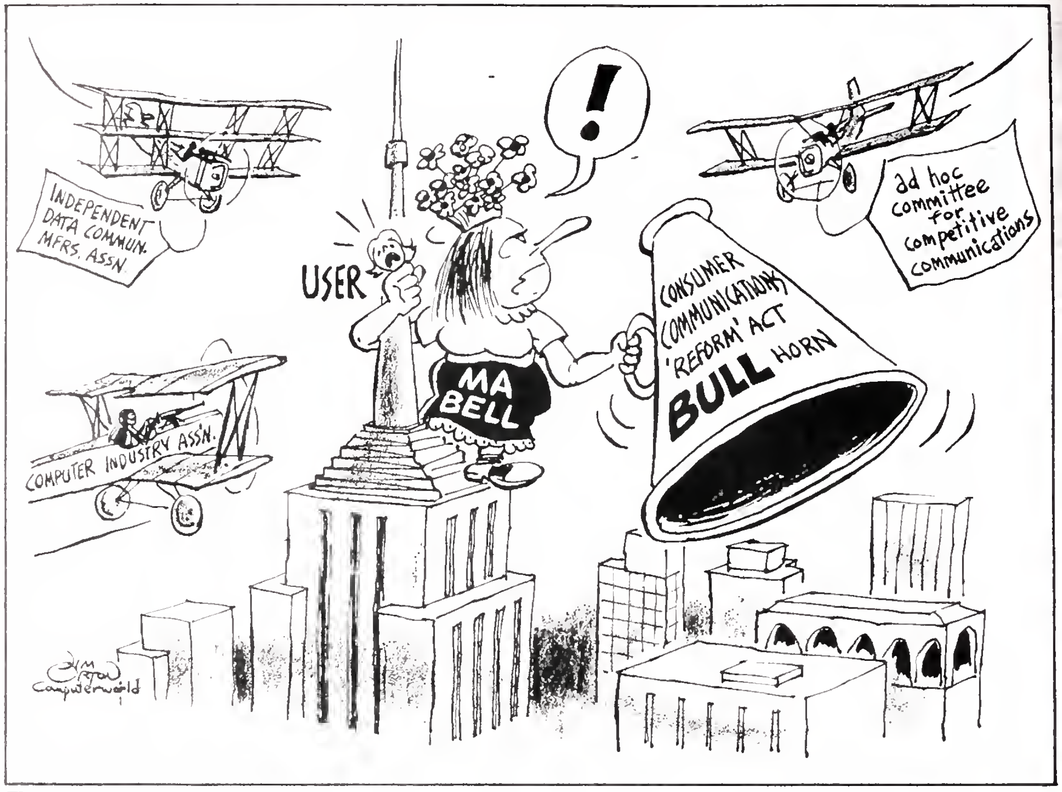
That office should immediately contact SSA and interested congressional investigators and offer to do a complete, independent study – not of the problems, which are well documented – but of various solutions that might help alleviate those problems.

The Afips organization can draw on the resources of the membership of its constituent societies for such a study and could perform a real service not only to SSA but also to the general public that foots the bill for the waste in the SSA operation.

It is also an issue that can be attacked solely on technical grounds, since the major questions raised are about the best methods for improving the utilization of equipment.

Afips, by its tax-free status, has to tread lightly on issues of public policy, but those questions are not raised in the present situation.

In fact the fit is so natural in this case, it is surprising Afips has not volunteered – at least publicly – to help out.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Computerworld

Letters to the Editor

System With Responsibilities Like Erda's Needs More Checks

After reading "Time-Sharing Center Aids Study of Nuclear Power" in the June 7 *Computerworld* I was unhappy to realize the Energy Research and Development Administration again chose a Control Data Corp. Cyber 73 to handle critical activities indigenous to nuclear-related information systems.

It seems strange Erda trusts a system with no internal error checking to handle "numerical simulation of experiments intended to provide better understanding of the complex plasma interactions which occur during controlled thermonuclear experiments." A Cybèr 73 does not even have parity in central memory.

In my experience, Cybers fail soft over a period of days before a hard failure. These failures can only be detected by analyzing results of applications programs.

I question Erda's choice of computer in handling this type of data. The Livermore facility is not the only Erda installation using Cybers for managing this kind of nuclear information. Many of the Erda sites use Cybers for designing and monitoring radioactive waste material and determining parameters for reactor start-up.

I would like to see a few more checks in the system with responsibilities like these.

Phillips Hughes
Olympia, Wash.

Adapso to Fight Reform Act; Other User Groups Urged to Join

A giant battle is shaping up in Washington, D.C., as signified in *Computerworld's* editorial of June 7 dealing with the misnamed "Consumer Communications Reform Act."

This legislation, while couched in public interest terms, is insidious at best. Interestingly enough, The Association of Data Processing Service Organizations (Adapso) is both a trade association and very much a user group (equipment and communications). We concur that every user group should actively participate on this subject. Adapso certainly is.

At a recent meeting of Adapso's Remote Processing Services Section, specific actions were determined to combat the deleterious effects this legislation promulgates.

As we view it, this legislation is an all-out effort of AT&T to weaken the regulatory structure of the Federal Communications Commission (FCC) and to further its aims of total monopoly of the communications field. Specifics of our program will be issued shortly.

J.L. Dreyer
Executive Vice-President
Adapso
Montvale, N.J.

'Groschly Disappointed'

I don't know who he is or what he is and am certainly not a fan, but with all due respect to Herb Grosch I was "groschly" disappointed in "Japan I."

Initially I assumed it to mean "Japan, Article Number One" and eagerly read into it. But instead it turned out to be Grosch praising the history and accomplishments of Grosch.

It only pointed out his nonability to inform and his superability to ramble and digress (cheap potshots at "ariline sales policy" and "punks instead of trained help").

I hope "Japan II" and "Japan III" are more interesting and informative and don't make the "I" mean "Watakushi-wa" but rather "Ichiban."

Mel Tosch
Detroit, Mich.

Data Past

Five Years Ago
June 30, 1971

WASHINGTON, D.C. – Ralph Nader asked the computer community to develop balanced uses of computers for returning power to the consumer and proposed a consumer information system, which was being worked on voluntarily by a number of computer professionals under the aegis of Nader's public interest research group.

– – –

WHITE PLAINS, N.Y. – IBM rearranged some maintenance prices and services and, for the most part, increased prices at its Service Bureau Corp.'s subsidiary's Datacenters. Rates on 14 machine models were reduced, charges on 116 equipment models were raised, and increases of 11% on the average were levied on all 360s, the 370/155, 2314 disks and 2401 series tape drives.

Eight Years Ago
June 26, 1968

WHITE PLAINS, N.Y. – IBM announced a faster 360/20 CPU, with double the main memory (from 16K- to 32K bytes). It was said to provide for more overlapping and considerably faster internal execution.

– – –

LOS ANGELES – Computer Sciences Corp. (CSC) entered the time-sharing market with plans to open time-sharing centers in 20 U.S. and Canadaina cities at a cost of about $50 million. CSC had been operating a remote batch processing network serving more than 150 organizations in the Western U.S. and Canada.

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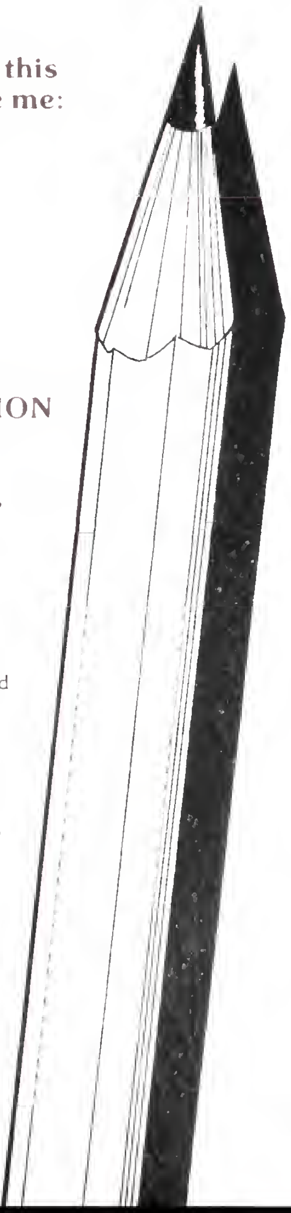

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Japan III

In two previous columns I wrote about my recent visit to Fujitsu and environs, and about how impressed I was to go at least partially behind the scenes in a company I believe will be the strongest challenge to IBM, at least outside the U.S., in the coming years. I carried the story to where I was on the stage at Nagoya, pontificating away in my usual blithe fashion.

CW readers who don't care about the Japanese banking automation ventures or about Fujitsu selling equipment in Jugoslavia may nevertheless wonder whether they can benefit on their home turf. Well, certainly the Japanese challenge, which has more *knowledgeable* government support than the French, German, or British equivalents, can help worldwide, if only by keeping Cary & Co. on their toes. Certainly selected Japanese components, terminals, peripheral gear, and very small and very large computers – the latter perhaps in "Amdahl mode" – will be available here. In fact, Honeywell is going to get its chips, or at least lots of them, from Nippon Electric. But there will be zones of avoidance: I don't see any encroachment here on the 360/30, 370/135 market, nor any immediate challenge to DEC and its competitors – not in North America. And never in software, in spite of the recent CII-Bull gesture; there aren't enough Japenese software artists to do the work at home, and the applications cultural barrier is high besides.

On the other hand, Toshiba has just entered the microprocessor/hobbyist market; computer games and toys can be expected; data communications gear, in spite of the different native environment, is being offered all over the world, and I understand it is competitive with German and Swedish (and French and English) equivalents.

One specific thing I called for at the Facom user meeting, looking hopefully at Fujitsu president Kobayashi as I did so, was more radical experiments in architecture. So far, the Fujitsu M-series multiprocessors, the Amdahl 470, the big Hitachi machines, and I presume most of the smaller computers of all the Japenese manufacturers have been very like the 360/370 system design. In fact, many are intended to be software (at least) compatible. I would like to see Fujitsu, or Hitachi or Nippon Electric less urgently perhaps, use its own funds or request government support to design and prototype one or more radically different architectures. I said clearly that there was major risk, that throughput might be disappointing, costs excessive at the production level, or (most likely) the novel result unsalable against IBM denigration. But it needs doing: needs doing desperately, somewhere in the world. And American firms seem not to have the nerve -- Burroughs is somewhat of an exception, of course. This is a major place where the Ministry of International Trade and Industry and the Science and Technology Agency could really help Japanese outfits, for the risks are certainly very high.

In response to a question from the floor about weaknesses in the Japanese effort (a very good and remarkable question), I pointed out that Japanese success in Western Europe, and ultimately just about everywhere in the world outside the Far East, might well be dependent on, and in any case would be greatly helped by, adopting the IBM World Trade strategy of hiring nationals. As salesmen, as maintenance engineers, as systems people, and as managers; not just as factory help. How well that got through translation and the remnants of the old Japanese xenophobia, I can't be sure but I meant it!

I was ushered into a superb lunch with Mutsuro Umezu of domestic marketing, and then sent out on tour while the indigenes went back to work. I once sat through a whole session of unalleviated Russian (and Cyrillic slides) without translation, in the Soviet Union; my Japanese hosts were kinder.

I've mentioned the elegant reception, better than any SHARE bash I can recall. Just before, the Facom Family chairman had presented me with "a very small gift" actually, a lavish one. And for my wife, the overseas marketing directors had salvaged the geisha's parasol, green silk and black-and-orange lacquer, from the detritus of a business-and-pleasure drinking bout some nights before, and wrapped it carefully for transport back to Sunnyvale. The social as well as the technical side was perfectly arranged.

I hope to go again, perhaps in October or November when the maples have turned and the weather is dry and clear. I hope to visit some users, not perhaps just Fujitsu but even IBM. The market is expanding so rapidly that an outsider is hard put to keep up; the space program was a case in point. I'm deeply interested in whether Nippon Electric software modules will work in Honeywell data management systems. I'd like to know more about some of the projects at NTT (the telephone company). And I want to rent a car and drive around those green mountains I saw from the train window, or ski in Hokkaido, if winter has come. Pat McGovern, the CW publisher, has had *fugu* and survived. I should do the same.

The first six trips were terrific. I look forward to the next (six, that is)!

Herb Grosch

Stolen Car Messages an Example

Training in System Dangers Could Prevent Tragedies

Last year it was in Florida. Last week it was in Massachusetts, a dozen miles from where I live. The routine police inquiry came back with a false report that a car or motor bike was stolen [CW June 21]. As a result, soon after there was tragedy.

How does it happen? How did it then happen again?

The Taylor Report
By
Alan Taylor, CDP

The latest explanation is that the motor bike had been properly registered 20 days earlier and that the registration had not gone into the computer. Apparently it takes two or three weeks routinely to enter new registrations and sometimes it takes months. The "stolen" report itself was some years old.

This is essentially the same problem as the Florida case [CW Dec. 10]. There an old, stolen report was not updated to show the issue of an identical registration number to prevent confusion.

In any event, the current explanations are inadequate. They do not explain why there is a reliance on other nonpriority procedures to remove a known file inaccuracy or danger.

Surely it doesn't take that long to remove the stolen report, even if registrations have to be backlogged, for some unknown reason.

Factually, the answer to the problem appears to be in the publicity issued some years ago when these database systems were first being sold to many police departments. The focus at that time was on the danger to policemen approaching unknown cars, not on any danger to people being approached.

Approach With Caution

The systems were designed to alert the policeman when to approach with more care than usual. Now it never hurts to exercise caution. So, approaching any car cautiously, stolen or not, seems innocuous.

There was no apparent reason to rush to prevent the system from warning of possible problems. Removing stolen-car reports was not a priority item. It could be, and it was left to routine action.

Now of course, it is known there are problems. The data on stolen cars in the file can lead to death. Yet clearly the "approach-with-caution" system must be retained. Policemen are entitled to all possible warning. So what is the solution?

Quick Cancellations

It seems to me file items that are dangerous should always have a way of being canceled quickly. In this case, part of the registration process should be to first clear out all dangerous data in the standing file. Can you see any reason why not? Or do you know of some better systems solution to the mistaken stolen car report problem?

Putting the system right does not end the problem, however. Even if the system logic is complete, the success of a system is not assured. It must also produce the correct results.

The current systems are not producing the correct results, so something has to change.

It appears what is happening is the behavior of the police may be changing. When a stolen car report is given, they think it definitely is a stolen car, when in fact no one yet knows for sure. This difference is a subtle one and easy to forget.

Probably the best approach to handling it would be to have the dangers of the system brought [illegible] to the attention of system users.

This could be [illegible] the stolen car message [illegible] think this would work. It would [illegible] routine and would be ignored [illegible] situation. However, it might [illegible] couldn't harm.

Training in the dangers seems to be the only real solution. I wonder if the Massachusetts people had been trained (or retrained) after the Florida incident?

I wonder whether the policemen now on the roads in this country have yet been trained about Massachusetts? I hope so, because trained users are the only ones that should be allowed to use dangerous systems. And we know the stolen car system is a dangerous one.

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Users Urged to Block Reform Act

Someday Smithsonian Could Hold Non-Bell Memorabilia

By R.J. Kaufman

Special to Computerworld

The year is 1984. Our families arrived in Washington, D.C. on Saturday. Monday morning was to see the start of a joint meeting between the Association of Data Communications Users (ADCU), the Data Processing Management Association (DPMA) and the Association for Computing Machinery (ACM). After checking in at the hotel, serveral of my computer associates said, "Let's go over to the Smithsonian."

So off we went to view America's memorabilia at the Smithsonian. While the children seem to be attracted to the spirit of St. Louis and the space capsules, our eyes seemed to take us to a corner of the room which had blinking lights.

Above the blinking lights was a gold sign which read, "Data Communications Circa 1968-1976." There in a glass-enclosed booth stood a modem. There was an inscription above it which stated: "This is the last independent modem ever produced."

A small inscribed plaque underneath it said: "This modem, unlike the telephone company modems in existence today, had options and diagnostics that were far ahead of its time."

Items and options, such as LSI, diagnostics, special quality monitoring systems, special data compression techniques, automatic trouble detection and other options were included. For service, all you had to do was swap a new one in and swap the old one out in approximately two minutes, the plaque said.

Reader Commentary

Next to the modem was a little black box which said, "Minicomputer for Packet-Switched Network." Underneath the unit was the following: "This minicomputer was used in what was called packet-switching." This allowed users of data communications equipment to pay only for the data they transmitted, and not for the time they used, which is currently the case for voice and data.

This minicomputer allowed hundreds of other computers and terminals to be all on one network, so that computers and terminals could talk to one another, even though each system was different.

Next to the display, with the minicomputer was another display. It pictured a telephone. On top of the telephone it said, "Datadial."

The explanation of the telephone said this was a telephone which allowed the user to dial another computer or terminal in less than one second and digitally connect the units together. Charges were based on how many bits were transmitted.

Then finally, next to the Data Transmission Co. "Datadial" telephone, was the original Carterfone. An inscription below it stated: "Here is the device which for a period of eight years opened the door to the latest and advanced technology in data communications and voice communications for the user." It did in 10 years what the telephone companies couldn't do in 50 years.

It brought the power of the computer closer to everyone. It provided terminals and other data communications to learn by, terminals to do business by and terminals and equipment to heal the sick by. Children were now able to learn history by computers, and doctors were able to get computer analysis of EKGs.

Data movement technology was pushed from 10 char./sec to 250 kbit/sec. Transmission services were developed to transmit the language of computers and not the language of voice. But it all went down the drain and came to a screeching halt in 1976.

For 1976 was the year congress passed the Consumer Communications Reform Act, known as H.R. 12323 and S. 3192. The congressmen who voted for the bill really didn't know what they were doing. They were scared by the clout of the big telephone company and the small telephone companies.

They were told if all this "harmful competition" wasn't eliminated, the consumer was going to pay a higher telephone bill. Of course, this was sheer nonsense as had been proved by several major consulting companies in the U.S. and the Federal Communications Commission.

But the data communications user, and even the one-time interconnect user, failed to inform their congressmen that before passing such a bill, every argument, pro and con, ought to be heard.

So our elected people up on Capitol Hill passed a bill into law about which they really knew nothing. The bill forever changed the Space-Age technology, which brought the power of the computer closer to the people of the world.

Because the users of this technology thought the Consumer Communications Reform Act of 1976 was a big joke, something to be passed over lightly, their technology was stopped dead in its tracks.

A technology which was started and had mushroomed to deliver economically the power of the computer to our homes, schools and businesses through the use of a telephone wire now came to an abrupt halt.

The above story can be true, if users don't wake up now. Users should urge their elected officials in Congress to hear the whole story from all sides before making a commitment.

Kaufman is operation systems project manager at Damon Corp. in Needham Heights, Mass.

DPers Feared Losing Innovator Status

By Ron Stewart

Special to Computerworld

The May 31 issue of *Computerworld* carried a Reader Commentary by Marianne Marino criticizing an editorial in the April issue of *Thruput*, the newsletter of the Association of Computer Programmers and Analysts (Acpa).

As the editor of *Thruput*, I feel moved to comment on some of Marino's comments. However, I would also like to recommend that CW readers obtain the editorial in Acpa's *Thruput* and read Marino's commentary in CW, as she made several very valid points which I will not touch upon below.

First, the thrust of the *Thruput* editorial was: "Hey, DP practitioner, we had better get our act together and start some serious consideration of things like certifiable computer installations, really good systems design, solid system and program controls, comprehensive standards, thorough project documentation and reporting and a uniform code of good practice."

Unless current DP practitioners begin thinking along these lines, we will abdicate the responsibility for further development of our profession one of these:

- A subset of the DP field (the DP auditors?).
- The accountants (who have already failed once in controlling the DP function).
- The Federal government (which has shown time and again how poorly it controls its own computer operations). This could very well relegate us to the role of technical support personnel rather than innovators.

My *Thruput* editorial emphatically echoed two excellent columns by CW's Alan Taylor [CW, Jan. 12 and 19], urging the DP professional society members into action along the same lines as the American Institute of Certified Public Accountants in developing standards and professional competence.

Evidently my call to action was more emphatic (and therefore more objectionable) than Taylor's, to arouse the ire of Marino!

In her commentary Marino reached the conclusion that because of management's authority to enforce auditor recommendations, "it is difficult to see how the auditing profession could gain control of the DP industry."

I agree, but I can easily see how we might abdicate our role in the development of standards, a uniform code or systems development methodology.

I strongly disagreed with Marino's use of the word "management," as it seemed to exclude DP management (and for that matter, auditing management).

As is pointed out in the original *Thruput* editorial, we have struggled long and hard to overcome 20-plus years of mismanagement by the accountants and the corporate financial area and have developed our own cadre of proven, seasoned DP managers. Now that we have had some success, it would be unfortunate to relinquish it to that very same financial management which also controls the internal auditors and influences the external ones.

Also I disagreed with Marino (and her choice of words) when she stated it "is hardly cause for weeping and gnashing of teeth on the part of DP (or is it Acpa?)" if management finds something of value in the recommendations of the auditors.

It is not so much that I "view the DP auditor as a competitor," but that I think it sad that the leadership in the area of standards development and the like must come from outside the mainstream of our field, from Marino's "reviewers" rather than from the innovators at the heart of our profession.

And I took exception to Marino's closing statement that "DP has made significant strides toward elimination of its growing pains . . . apparently Acpa would rather it eliminated the competition."

First, my editorial musings hardly reflected the policy of Acpa . . . for that she might look at *Thruput*'s monthly Chairman's Message or the reports on the activities of the Acpa Board.

Second, I hope it is clear from the above comments that I do not advocate elimination of competition, but wish to encourage participation by all levels and areas of our profession in guiding the future of our chosen field.

Finally, I would like to take a page from the views of Kenniston W. Lord, Jr., former president of the Society of Certified Data Processors (SCDP) and encourage the interchange of ideas and viewpoints between DP practitioners in the pages of CW or *Thruput* or any other vehicle of communication.

Only through the communication of differing positions on any pertinent issue can the majority of DP practitioners become aware of those issues.

Stewart is editor of Thruput *and an independent consultant.*

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NBS Conference Notes in Print

SPRINGFIELD, Va. – Proceedings of the second national symposium on the management of data elements in computer processing have been published by the National Bureau of Standards (NBS).

The 278-page book contains 28 technical papers on data management and standardization in areas such as data resource management, role of the data manager, communications needs for data standards, data dictionary/directory systems, product coding, use of check characters, data elements in bibliographic data bases, coding for clinical medicine, data standards for education and data base management systems.

Cosponsored by NBS and the American National Standards Institute, the symposium was held last Oct. 23-24. Over 300 representatives of government, industry and academia from 29 states and three foreign countries participated.

The symposium's theme was the need to recognize data as a tangible resource and to apply management methods equivalent to those controlling other valuable resources.

Cataloged as report number PB-249-530, the symposium proceedings can be obtained in paperback for $9.25 or on microfiche for $1.45 from the National Technical Information Service, Department of Commerce, 5285 Port Royal Road, Springfield, Va. 22151.

'Word/One' Ready for IBM CPUs

NEW YORK – The Word/One interactive text-processing system, long available as a service facility on the Bowne Time Sharing, Inc. network, is now packaged for installation on an IBM 360/370 user's in-house equipment, according to Bowne.

Designed to be used by typists, secretaries and others in the document-preparation and word-processing areas, Word/One enables users to enter and display textual information from a typewriter terminal and to use a broad range of editing and text reorganization facilities, Bowne said.

The software also supports a "comprehensive" range of data search and selective information retrieval features, a spokesman noted.

Word/One system features are said to include text editing with static line numbers. All text units are sequentially numbered as they are entered and these assignments remain static regardless of additions or deletions to the text, Bowne explained.

Replacement or insertion of new text can be on a line-by-line, word-by-word or character-by-character basis, and changes can be on either local or global parameters, the vendor added.

A number of "housekeeping" chores can be handled automatically by the system under user control, the spokesman said. These include such things as text centering, right-margin justification, page and paragraph numbering and underscoring and overstriking (which darkens the letters or words involved), Bowne noted.

The system also is reportedly capable of generating tables of contents on command and of marking those parts of a new draft which are changed from a previous version.

Word/One runs under OS/VS1 or VS2 or, with a different version, under DOS. The data set containing all Word/One application programs requires 10 cylinders of 2314 or 3330 space, while the accounting facilities require about another 20 cylinders, although this varies from site to site.

Lease price for a "typical 10- to 15-terminal system" is $1,200/mo, according to Bowne, which is at 345 Hudson St., New York, N.Y. 10014.

PCS Extends APL Workspace Size

VAN NUYS, Calif. – Proprietary Computer Systems, Inc. (PCS) has increased the size of its APL workspaces to 100,000 bytes from 64,000. PCS uses an enhanced version of IBM's APL.SV in its Computernet on-line computing service.

An APL workspace is the amount of core storage available to an individual user at one·time. PCS' larger workspace size is two to three times bigger than the main memories of most minicomputers, it said.

A user can maintain his own private library of workspaces containing data and programs he has written; in addition, he can use PCS' library of ready-to-use application programs, the company said.

For large files of data, PCS has developed system software that is said to allow a user to directly address millions of bytes of data organized as a file. For these applications, PCS noted, it has also developed a higher-level language that can be used to operate on file data and to create finished management reports.

PCS charges .01 cent per 1,000 bytes per day.

PCS/Computernet offers local dial-up service from major cities in the U.S. and Europe.

PCS is headquartered at 16625 Saticoy St., Van Nuys, Calif. 91406.

'Trend Analysis' Package Pulls Data From IMS Base

WHITE PLAINS, N.Y. Although initially developed for financial institutions, the Trend Analysis/370 package from IBM can be used in other business areas such as manufacturing, retailing, distribution, processing and utilities, a spokesman said recently.

The program product enables users working with an IBM 370/145 or larger CPU and 3270 terminals to create and display three different types of business information reports, he explained.

With extra software, an IBM System 7 and a television set linked to the 370, the user can have the reports in various colors, IBM noted.

Single period comparisons, one of the basic report formats, compares the performance of several measures of an organization's activities bank loans, deposits and withdrawals, for example for a given period. This in effect provides "snapshots" of the organization's status, the spokesman said.

Historical analysis, another of the possible outputs, compares the performance of different elements, such as available credit, cash flow and investments, of a single company over a period of time.

Finally, historical comparison, which compares one element in several different companies over a period of time assuming the user has built up the appropriate data base about other companies is the third type of output from Trend Analysis/370.

Three Report Forms

Reports may be generated in tabular form, as bar graphs or as line charts and the output may be directed to the 3277 screen, an IBM 3286 printer or the user's television unit, according to IBM.

Standard report formats are useful because, although they limit the amount of individually desirable information that can be retrieved from the data base, they also simplify the user's interface with the system; the user merely picks items from several "menus" that appear on the 3270 screen, IBM said.

The package requires a 370/145 or larger CPU with a minimum of 1M byte of main memory. In addition to the Trend Analysis/370 software, users must also have IMS/VS installed, the spokesman noted.

First customer shipments of Trend Analysis/370 will begin this fall and the package will be available under license for $500/mo. The optional program enabling users to produce color graphs if they have the System 7 and TV equipment as well as the 370 will be $160/mo.

Neat/3 Program Building Eased With 'Pass/3' From Independent

CONCORD, Calif. The Programming and Analysis Support System 3 (Pass/3) recently introduced by Century Analysis is a generator which produces Neat/3 source programs for NCR Century CPUs from "system-level" definitions, the independent said.

Programming effort and cost can be cut as much as 85% with this tool, the vendor claimed. But perhaps the most unusual aspect of Pass/3 is the way Century Analysis charges for its use by the number of lines of code generated rather than a fixed monthly license fee.

To enables users to define their needs on the highest level possible, Pass/3 is said to support three levels of logic above that of Neat/3 itself. The level the vendor calls Fixed Logic takes into account the type of program being generated since, according to a spokesman, "report logic is completely different from capture logic."

So-called Specific Logic is produced based on input forms designed for a specific type of program. "Capture" input forms, for example, provide a means for the analyst to specify validation rules "in a very abbreviated fashion," the vendor explained.

Common Logic "is at a level above present compilers" and is available to all program types, Century Analysis continued.

Since Neat/3 is the output of the Pass/3 processing, the analyst always has the option of coding directly in that language if he is unable to define his problem within Pass/3's facilities, the company added.

In addition to producing source programs, Pass/3 also develops documentation, apparently subject to user specification. One possibility cited by the vendor was the creation of the operating instructions for the program being developed.

The generator requires a 32K Century 101 or larger machine, although the generated programs can be run on any Century on which they fit, including the 50, Century Analysis said.

There is no initial installation charge.

Century Analysis can be reached through P.O. Box 880, Concord, Calif. 94522.

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NCR 'Scholars' Now Complete

DAYTON, Ohio – With the availability of modules for test history evaluation and academic history, NCR has released the final pieces of its School Automated Records System (Scholars) for student records management.

Scholars now includes eight modules. The data base and control modules are required elements of every system because they provide basic services and build and maintain the single data base used by the six functional modules, an NCR spokesman explained.

The application modules include student scheduling, grade reporting, optical scanning for test scoring and other bulk data entry functions, attendance reporting – all of which were previously released – and the two latest modules.

As integrated elements within Scholars, the test history evaluation and academic history modules are said to interact with the other modules.

Among reports produced by the academic history module are student profiles, class rankings, honor rolls, transcripts and permanent record labels.

The test evaluation module provides scoring for both commercial and teacher-made tests, plus a variety of analytical reports for teachers, counselors and administrators, NCR said.

The software itself operates on any NCR Criterion or Century CPU with 32K or larger memory; it can also be run on NCR's Century 8200 mini, he said.

Scholars software is subject to a monthly license fee of $80 but users may elect an annual fee of $850 or a one-time license charge of $12,500, the company said.

NCR is headquartered at 17th and K Streets, Dayton, Ohio 45479.

'IFPS' Runs Financial Models, Report Generation on Cybernet

MINNEAPOLIS – Financial planning and analysis software is now available through the worldwide Cybernet time-sharing networks of Control Data Corp.

The Interactive Financial Planning System (IFPS), developed by Execucom Systems Corp. of Austin, Texas, includes a user-oriented report generation system designed to help business executives evaluate financial situations, CDC said.

IFPS handles such activities as long-range strategic planning, intermediate and short-range tactical planning, capital budgeting, resource allocation and cash-flow analysis, according to the firm.

Because the language consists of English-like statements, the user does not need programming skills to use IFPS, the vendor emphasized.

IFPS offers spread-sheet analysis for such reports as profit-and-loss or cash-flow forecasts and risk analysis for use in calculating probable results of new product introductions, marketing strategies, acquisitions or mergers.

A "what-if" command is available with either technique, allowing the user to try different variables and learn which factors are most critical to the problem, a spokesman noted.

On the interactive Cybernet networks, a small model may be built and solved for less than $5, with complex models rarely costing more than $50 to build and solve, CDC said.

CDC is at P.O. Box 0, HQW05I, Minneapolis, Minn. 55440.

Software Course Set For Hardware People

MOUNTAIN VIEW, Calif. – A self-teaching course designed to meet the needs of hardware designers learning software has been introduced by Creative Computer.

"Microcomputer Programming with Modu-Learn" is said to cover the spectrum of microcomputer software topics. Much of the material presented has only been available in a limited number of intensive programming courses and seminars, the vendor claimed.

The course is divided into 10 self-teaching lessons, with additional sections of information on computer architecture, operation and software systems. Each lesson is divided into sections on software concepts and implementation.

Theory and Practice

The concept sections discuss the theory behind software techniques or problems that are commonly encountered in microcomputer applications; the implementation sections then show how to put theory into practice on real microcomputers, a spokesman explained.

Throughout the course, emphasis is placed on understanding the hardware/software relationships that must be considered when designing a microprocessor-based digital system, the spokesman said.

The Modu-Learn course is distributed in a sequence of five shipments, with the first shipment available in 30 days. The unit cost is $49.95, with quantity prices available.

Creative Computer is at Suite 4, 1901 Old Middlefield Way, Mountain View, Calif. 94043.

Version of 'Mark IV' Adapted to VS/9 Use

WOODLAND HILLS, Calif. – A version of the Mark IV system from Informatics, Inc. is now available to users of the VS/9 operating system on the larger Univac Series 90 CPUs equipped with virtual storage facilities.

Mark IV supports a variety of utility and application-oriented DP functions including the handling of file and data base maintenance, retrieval of specified data, computations, report preparations and output file creation, Informatics said.

It is considered a nonprocedural language and, according to its proponents, is one of the highest of the high-level languages that exist today. Mark IV is the only software product of its type currently available to VS/9 users, Informatics claimed.

Mark IV is available for one-time costs ranging from $21,000 to $37,000 depending on options selected by the individual installation, a spokesman said from 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

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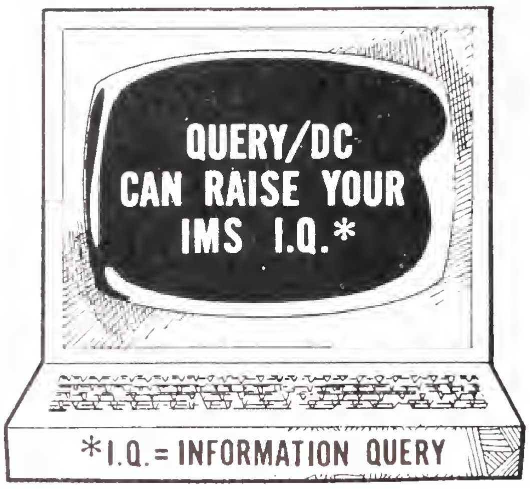
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A systems analyst says of his firm's new QUERY/DC capability: "After an in-house QDC class by Informatics, one of our users produced the exact reports he wanted. We had tried for five months to do that job in Cobol. Now he prepares his own IMS queries with QDC in less time than it would take to explain his problem to me."

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Data Errors Can and Must Be Controlled, Users Told

By John P. Hebert
Of the CW Staff

NEW YORK – Incorrect data is a serious impediment to effective use of computerized data bases, but conventional approaches to the design and implementation of automated error-detection systems are inadequate for large and complex bases, according to Michael Hammer of MIT's Laboratory for Computer Science.

Suggesting a "structured" approach to error detection, Hammer emphasized at a recent conference here the need for users to adapt the approach to changing requirements in different error situations.

First, the user has to recognize the limitations imposed by the costs of error detection – which are often prohibitive – and realize, in any case, mistakes will be made that cannot be found, he said.

Secondly, an organization can usually exist with moderately correct data; a controlled amount of errors have to be accepted, depending on the critical degree of the area where the errors occur, he said.

He stressed the importance of "error detection not being an end in itself." Once errors are found a solution to correcting the source of the incorrect data must then follow.

Errors Differ in Type

To help discovering the errors, the user should be aware of the different types of errors in the data base and be able to identify them, Hammer said.

The simplest type of error is an individual value which is inappropriate for the field in which it is contained. Moving deeper into complexity, he said, "look for inconsistencies between different fields of the same record.

"Also look for an inconsistency between the fields of one record and the fields of related records.

"Finally", he advised, "look for a global pattern that is out of order in some set of records or in the data base as a whole rather than for individual errors."

Other "gray areas" are obsolete data and missing data. In all of these instances, a developing trend of data out of the norm over time may be found, he said.

Whatever type of error is found, the degree of error must then be decided and appropriate action taken, according to degree of importance.

Areas in which to concentrate efforts that help avoid mistakes might include data entry, where operator training and incentives may help to prevent erroneous data; forms design, system workload, and the underlying file design [illegible] volatile and nonvolatile data, for example," he said.

In a separate presentation at the [illegible] session, Grayce Boothe of Honeywell Information Systems warned that rapid technological change currently dictates against attempting to combine a distributed processing system with a distributed data base.

Although distributed systems can now be built well, she said, the distributed data base is not as well developed in concept or in practice. And the advantages usually are outweighed by the disadvantages.

The advantages of a large, distributed hierarchical system, cited by many users, are improved performance and response, control through local management, improved availability and reliability of data, and often, decreased communications costs, Boothe said.

Critic Disregarded '74 Cobol Features

By Ken Seidel
Special to Computerworld

The anti-Cobol article by Tom McSloy, capped by its sensational headline, "Trying New Techniques with Cobol Called Hopeless" [CW, May 31], must not go unanswered.

First, it appears no knocker of Cobol is aware of the Ansi 1974-Standard's Interprogram Communication features; these allow a user to divide the programming task into independently compiled subprograms. Parameter passing is accomplished by the construct:

CALL subprogramentry USING parameterlist (e.g., CALL "XYZ" USING PARM1, PARM2.).

In a subprogram, the linkage section provides a description facility for the passed parameters (actually the addresses of parameters are passed, enabling the subprogram to access the caller's data).

Second, how can supposedly knowledgeable critics allege Cobol lacks "disciplined" constructs such as IF . . . THEN DO . . . ELSE DO . . . "? The plain fact is that Cobol *does* possess this type of logic, and criticizing the fact that PERFORM is not identical to DO block is pretty silly when the same general capability is obviously there.

In fact, an unbiased critic would realize the clarity of control can be enhanced by simply writing IF condition PERFORM section-name-to-handle-it ELSE . . . , then embedding a complicated and heavily nested DO block in the midst of the statement after the condition.

Then too, nested IF statements are also available in Cobol, if one so desires. (Let me also note here that THEN is no longer an official reserved word.)

Really, it is absurd for a critic who does not have practical experience with a particular language to hole up in his private tower and castigate that language, ignoring its merits and its particular design assumptions. As an example of this, I cite McSloy's plaintive carping that periods are critical to Cobol sentence structure.

Is not the semicolon equally critical to the construction of a PL/I program? And is not Fortran's reliance on C in column 1 an equally arbitrary thing for that language?

As to McSloy's claim that no macroprocessor exists for Cobol, it appears he is unaware of a large commercial market thriving in support of Cobol. Information Management, Inc. of California bases its entire marketing philosophy around managing the Cobol programming environment (the biggest of them all) and offers products and services of just the kind McSloy suggested cannot be had. Other companies are active in this marketplace, too.

Seidel is president of Seidel Computer Associated, Inc. of Fallbrook, California, which is engaged in implementation of Cobol compilers.

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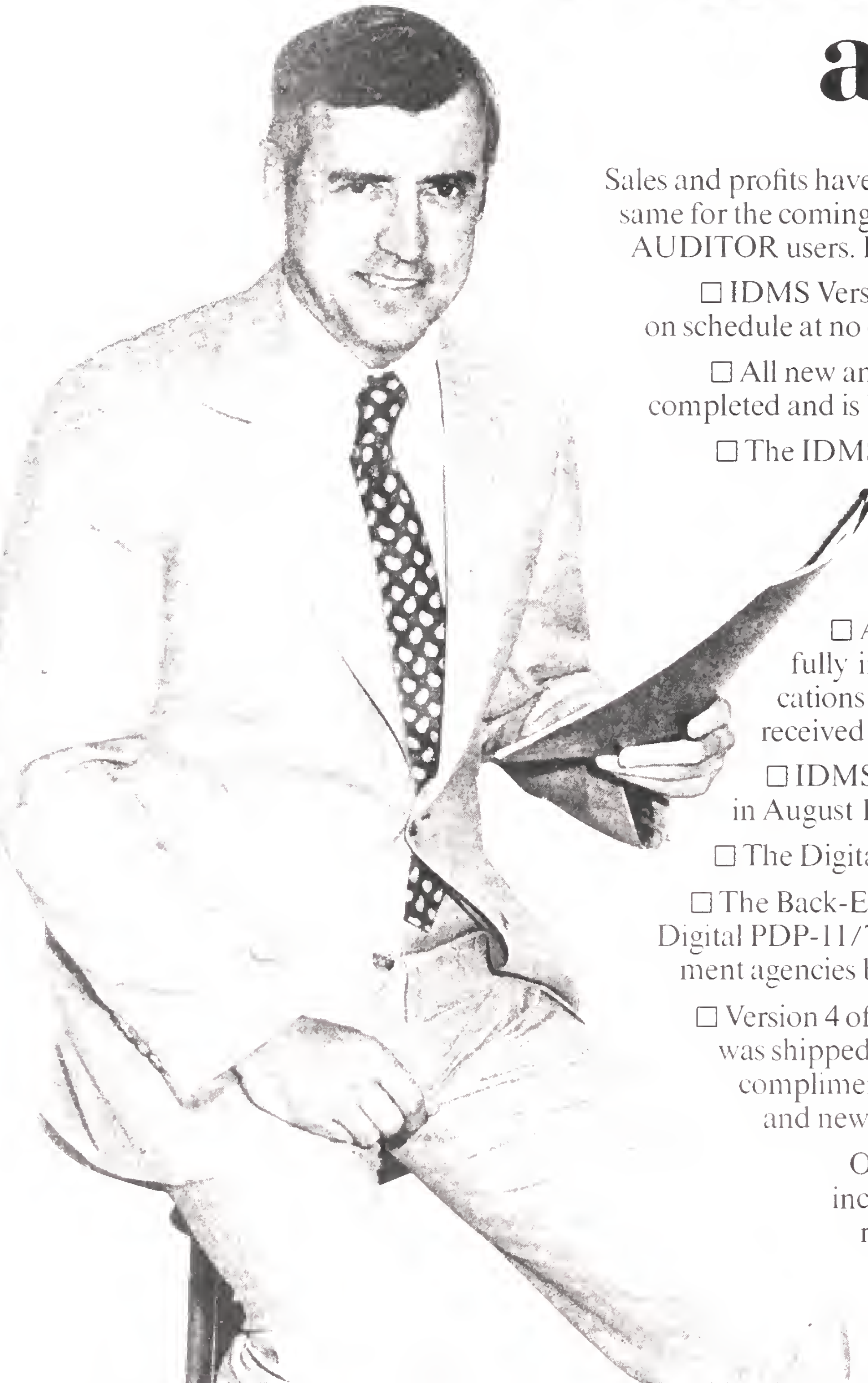

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☐ A communications monitor has been acquired and will be fully integrated with IDMS to support a high volume communications environment. This product is so good that we have already received many orders for it.

☐ IDMS On-Line Query (Version 1) will be ready ahead of schedule in August 1976.

☐ The Digital PDP-11/70 IDMS version is operational.

☐ The Back-End Database Management System project (interfacing the Digital PDP-11/70 to the IBM 370) is underway for delivery to four government agencies by February 1977.

☐ Version 4 of EDP-AUDITOR /CULPRIT with all new documentation was shipped in May at no charge to users. We have received many complimentary letters about the documentation, ease of installation, and new facilities of Version 4.

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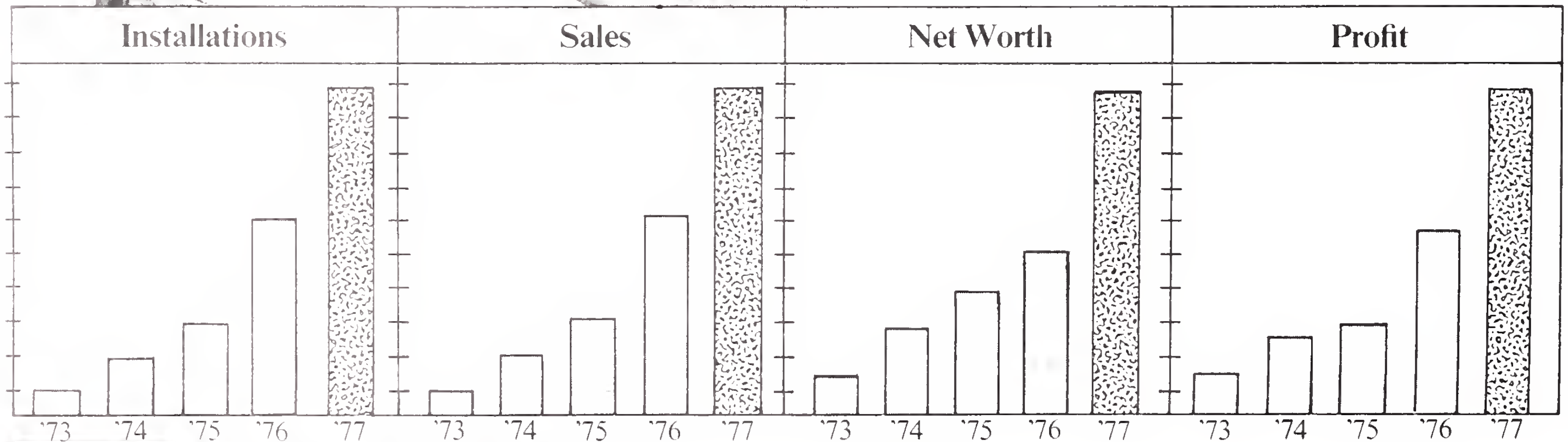

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Structured System Design More Vital Than Language

By Kenneth T. Orr

Special to Computerworld

If you leave them alone, certain arguments will go away. Unfortunately, some require repeated discussion, and one of these is the question of the relation of "structured programming" to programming languages.

Concepts and Techniques

I spend a great deal of my time going around the country telling people that "structured programming" is a way of looking at a problem, not a coding technique. I am particularly distressed, therefore, to see articles like the one by Tom McSloy [CW, May 31] which seemed to indicate that, unless the entire world immediately recognizes the futility of programming in anything but PL/I, we're doomed to poor programming forever.

At last count, we at Langston, Kitch and Associates found people doing structured programming in Cobol, Fortran, Algol, PL/I, Assembler, APL and, of all things, RPG-II.

However, despite protests to the contrary, Cobol has turned out to be a very hospitable language for doing structured programming based on *structured systems designs*. What is critical in taking advantage of the new technologies is an appreciation of logical, structured design.

If one attacks a problem logically and with the right design tools, the language used to code the problem becomes considerably less important.

For some time now, we have been employing an approach called "structured systems design," which is based on our own work, on structured programming and on the work of Jean-Dominique Warnier in France. It works with or without GOTOs or local variables or a macro facility. It does require, however, a thorough job of logical analysis and design.

No doubt we will see in the future the evolution of new languages for programming which will be aimed specifically at structured programming. And no doubt they will be somewhat different than Cobol is today (or PL/I for that matter).

However, to make the claim that structured programming in Cobol is hopeless does nobody any good, not even those who think PL/I represents the wave of the future.

The problem of whether programming language A vs. programming language B is better for the new techniques is much like the importance of car design on safety. If I go out to buy a car, a foreign car dealer which can demonstrate its automobile is significantly safer than others because of special design features can sell me a car.

And yet we all know the most significant safety device in an automobile is the driver.

I have the opportunity to see a wide variety of lousy programs as I travel around the country. My students often come up to me and say something like, "You won't believe this code," which of course is a program they have to maintain.

My experience is that there is damn little difference between lousy programs written in Cobol and lousy programs written in PL/I.

In fact, one can even be trickier and therefore lousier in PL/I than in Cobol. Moreover, the fact that PL/I has the ability to logically nest conditions sanely doesn't mean PL/I programmers are apt to use that facility or the DO WHILE facility or the Macro facility either.

But while the programming language used doesn't seem to be highly correlated with good (or lousy) programs, the underlying design does. As a result of structured systems design and programming desciphne, I've seen more excellent programs in the last two years which run correctly the first time than I have in the previous 14 years using traditional design and coding techniques.

Orr is director of advanced sytems for Langston, Kitch and Associates in Topeka, Kan., and a lecturer and writer on software and systems design.

Even PL/I Carries No 'Good Program' Guarantee

By Richard J. Weiland

Special to Computerworld

It is distressing to see a consultant of Tom McSloy's caliber miss so much of the point with regard to doing structured programming in Cobol as he did in "Trying New Techniques With Cobol Called Hopeless" [CW, May 31].

In the first place, choice of a language has very little to do with structured programming. Thinking through the transformations that produce desired results, developing a functional design and organizing the flow of control have nothing much to do with whether one is going to code in Cobol, PL/I, Fortran, Assembler or Lisp.

While it is certainly true that some languages lend themselves more directly to encoding the control structures that have been fairly generally agreed upon (i.e., concatenation, alternation, iteration), anybody who can't figure out how to implement a DO WHILE loop in *any* language better go back to school.

And the unfortunate fact is that programs written in PL/I (which does so lend itself) are typically as crummy and unstructured as those in any other language. Go look at the code on somebody else's desk for ready examples.

Reasonable use of DO groups, to say nothing of reasonable use of BEGIN groups (to define data locally) is about as common as amicable lunches between the IBM and Justice Department legal staffs.

Obviously, this is not to say that one can't write handsomely structured PL/I, just that not very many people do, alas. Simply picking PL/I for coding is not enough.

Features Not Missing

Second, the 1974 ANS Cobol specifications include most of the features McSloy mourns as missing. (That standard must be one of the industry's least read books.)

A reasonable collection of vendors have made good progress in making these features available, if they did not already exist as extensions to their ANS 1968 Cobol compilers.

Let me not get too far into a Cobol vs. PL/I shouting match. Nobody is going to argue that Cobol is flaw-free or particularly graceful.

But for every one of the Cobol defects McSloy cited, there is either an exceedingly simply way of getting around the problems or an equally obvious wart on PL/I to match. The line of candidates for sainthood among programming languages is remarkably short.

It is hard for me to take McSloy's "hopeless" epithet for Cobol very seriously. Faults there are, problems there are, fudges occasionally are needed in using Cobol.

But there are just too many people and organizations around these days successfully doing structured programming in Cobol for anyone simply to throw up his hands at Cobol and hope it will go away.

Weiland does structured programming in a variety of languages for SEI Computer Services of Chicago, and lectures on "How to Teach Structured Cobol" for Yourdon, Inc. of New York.

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First Memorex 1377 User Reports Units Working Fine

By Ronald A. Frank
Of the CW Staff

DALLAS – "All we did was unplug the IBM 3277 and plug in the 1377 replacement." It was the first time the 1377 had every been hooked up to a CPU in a customer environment and it worked fine, according to Phil Schilt, director of data services for Omnis Corp.

The CRT terminal Schilt described was the first installation of the Memorex 1377, a plug-compatible replacement for the IBM 3277. The 1377 operates behind the standard IBM subsystem controller and therefore requires no changes to the rest of the configuration, Schilt said.

Omnis Corp., the DP arm of Dallas-based Sammons Enterprises, Inc., has also found other configurations in which the 1377s will operate. One of the CRTs acts as an alternate system console device for the firm's 370/158 at a price about 34% below the standard Model 158 console, Schilt said.

The Memorex terminals will also be used as data entry terminals in the company's planned IBM 3790 system, he said.

The 1377s are described as completely transparent and IBM representatives can run standard Olteps diagnostic routines even without switching the non-IBM CRTs out of the various configurations, Schilt said.

Omnis currently has about 12 of the 1377s. Some operate in local mode to the mainframe behind an IBM 3272 controller, others, installed at an Omnis location several blocks from the 370/158, are interfaced to an IBM 3271 controller and transmit data at 7,200 bit/sec over private lines using data sets supplied by International Communications Corp.

This data is transmitted to a Memorex 1270 terminal control unit attached to the CPU. As part of a system upgrade to distributed processing, Omnis is planning to replace the 1270 with a Memorex 1380 front end, Schilt said.

$40/Mo Less Expensive

Addition of the 1377 terminals has saved his company about $40/mo per terminal compared with IBM 3277s and, in the course of a year, Schilt said he expects to save between $12,000 to $15,000.

The Memorex units were installed under a two-year lease plan which provides price protection while the 3277 is available only on a month-to-month basis from IBM, he said.

The CRTs are used in a claims processing application which Omnis does for its affiliated company, Reserve Life Insurance Co. The policyholder data base contains information on about 1.1 million accounts. The CRTs are operating under CICS/VS, which runs on the Model 158 in 1.5M bytes of virtual storage.

Seven Days to Two

Accident and health policy claims are called in to the Omnis DP center here, where information is entered into the 1377s by operators taking the phone information. The operators verify the policy data and then check to see that no previous claim has been filed.

Periodically during each day, claims checks are issued to policyholders. The terminal inquiry system is expected to reduce the claims-processing cycle from the present seven days to two days, Schilt said.

The 370/158 runs under OS/VS2 Release 1.7 and a memory upgrade of 1M byte using Memorex add-on storage is to be implemented soon, he said. In addition, Schilt noted, Omnis will install the Mod III upgrade from IBM which should provide an "8% to 11% improvement" in CPU throughput.

Speed No Stranger at Company Where Net Goes Up in 90 Days

By John P. Hebert
Of the CW Staff

MEMPHIS, Tenn. – Everything that happens at Federal Express Corp. happens very quickly and installing an interim computerized terminal communications system seems to have been no exception to Federal's ability to compress time on company projects.

It took 90 days for the airline, which specializes in the overnight, door-to-door transportation of small packages and time-sensitive documents, to set up Datacomm a point-to-point terminal communications system.

The real-time system helps Federal keep track of shipments, flights and aviation weather for its 32 Falcon fanjets, 11 leased airplanes and a surface fleet of more than 600 vehicles, according to Charles Brandon, Federal's vice-president of operations planning.

Three-Month Project

The three-month race to implement the system included training all personnel who would work with Datacomm, setting up a mainframe here, tying in almost 90 intelligent communications terminals and linking this segment of the system to a high-speed airline message-switching computer system in Los Angeles, Brandon said.

Datacomm is presently composed of almost 100 IBM 3767 models 1 and 2 keyboard line-matrix printer terminals operating at 40- and 80 char./sec. Messages are received by a 32K-byte IBM System 7 CPU working in conjunction with a card reader, Philips-type cassette and a Teletype, he said.

The terminals send and receive data from the Memphis mainframe over six synchronous dedicated lines at 1,200 bit/sec; there is one 1,200 bit/sec line for in-house communications between the mainframe and the Teletype, he said.

Federal's "first step" at computerized networking is linked to an IBM 360/65 host computer at Mutual Computer Services (MCS) in Los Angeles, where Federal's messages are switched under an airline control program, Brandon said.

This link is through ICC/Milgo synchronous modems and a dedicated 2,400 bit/sec line, which has dial-up backup capabilities in the event of line failure, he added.

Federal Express itself was started from scratch in April 1973, delivering a few dozen packages among six cities. The company now handles about 20,000 pieces of freight weighing 14 or 15 pounds on the average daily, according to Brandon.

The company needs immediate communications among the 75 cities and corporate headquarters. "The communications network must be able to answer an inquiry or check the whereabouts of a shipment within minutes to meet the level of service customers expect," Brandon said.

Because the company has "grown like topsy" and still has "growing pains," it outgrew its TWX network because it was not fast enough and had no broadcast capability.

"We needed a way to get the computer flight plans out to the carriers and get things done quickly," Brandon recalled.

Even though a message from a 3767 terminal has to be routed through the System 7 in Memphis and then to Los Angeles and back through the 7 CPU again, "the response time is always under 3 sec and 1.5 sec is hardly unusual," he said.

Success Credited to Planning

The reason why Datacomm is so fast, Brandon explained, is because all the complex message-switching is performed on a much larger machine and the airline control program at MCS is a very fast program with a high-volume, fast rate of response.

Aside from the computer end of things, the system's installation "went so well because we planned the hell out of it. We were like the military when we developed it and had meetings discussing it every Monday morning," he said.

Hartke Hoping for Congress To Cut FCC Policymaking Power

FRENCH LICK, Ind. - The Federal Communications Commission's (FCC) trend toward new telecommunications policies "unratified by the Congress has been accelerating at an alarming rate," according to Sen. Vance Hartke (D-Ind.).

Speaking at the recent annual convention of the Indiana Telephone Association, Hartke said Congress will have to deal with the issues raised by the Consumer Communications Reform Act. Hartke is a major sponsor of the Senate version of the proposed legislation [CW, March 22].

"My mail indicates that many private citizens are awakening to the possible impact [of competition] on their telephone rates and services. Some have communicated with me directly – others are speaking through organized consumer groups.

"And, finally state, local and Federal government agencies are considering their involvement in the debate," Hartke said.

"The emergence of the computer and its dependence on telecommunications to reach distant terminal stations" could not have been anticipated when the Communications Act under which the FCC operates was first drawn up in 1934, he said.

"The FCC has had to make very difficult regulatory judgments which were, in fact, new policies. Thanks to the alertness of the telephone industry, I think Congress will get to the issue of appropriate regulation of telecommunications carriers" before it is too late.

"We have a good chance of getting there before an irreversible regulatory policy has been locked in concrete," Hartke said.

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Front End Eases Processing Load for CPU in NBS Net

By John P. Hebert
Of the CW Staff

GAITHERSBURG, Md. – The National Bureau of Standards' (NBS) Computer Services Division faced a processing overload when it switched from a batch-oriented service center to a time-sharing service bureau two years ago.

But the division was prepared for the change – it knew it would need a larger front-end processor to help its Univac 1108 mainframe handle the increased processing requirements inherent in a large communications network.

The division believed the ideal front-end processor would have to handle a 200 kbit/sec workload with peaks of 250 kbit/sec from the NBS laboratories alone, according to Ray Shaver, chief of systems operation.

These "fairly ambitious specifications" were compounded by management's requirement for 99% uptime from any unit installed, he recalled.

"We needed something to handle the increased communications workload and be flexible enough to grow" to meet the anticipated load, Shaver said.

Two Choices Available

The products of vendors, Univac and Omnus Computer Corp., filled the requirements set forth by the center. Omnus made a lower bid to do the job with its Omnus-1/CU and, as required by government procurement policy, was chosen.

The Omnus equipment was installed in July 1974 and finished acceptance testing in September with over 99% uptime.

"We were way ahead of ourselves when we opted for the Omnus," Shaver said.

Working through the Omnus-1/CU, the Univac 1108 CPU provides computer support for the NBS laboratories, which use it for scientific computation and engineering problems; support for NBS administrative work and some government data bases; and work for government agencies, including the Department of Transportation, he said.

And because of the government's policy of encouraging the purchase of the lowest bidder's equipment, there is "a lot of foreign hardware hanging off the 1108" – Ampex, Inc., California Computer Products, Inc. disk drives and Storage Technology Corp. tape drives.

"It's not too bad a situation because we do our own hardware maintenance," Shaver explained.

Terminals tying into this computer system are "scattered all over the place," Shaver said.

Melange of Terminals

There is a mixture of remote batch terminals emulating Univac 1004 protocols: Harris Cope 1200 and 1600s, Digital Equipment Corp. PDP-11s, Data 100 units, Remcom Systems, Inc. devices and "even a Singer terminal."

In addition, the Omnus-1/CU handles true Univac DCT 1000s, DCT 2000s and Univac 9300 batch terminals.

The 1004 emulators are centered for the most part on the East Coast, except for a 9300 in the NBS Boulder, Col. labs, he said.

Interactive terminals tied into the front-end processor emulate Teletype equipment and communicate in Ascii at 110-to 1,200 bit/sec on dial-up phone lines.

The interactive terminals used include the Texas Instruments Corp. Silent 700 series, Omron CRTs and a Tektronix, Inc. 4014 graphics terminal used for plotting, Shaver said, adding NBS expects much growth in the interactive graphics terminal area.

Modems and Data Sets

Modems utilized by the NBS computer center and at the remote sites include Vadic Corp. card-type units working at 300 bit/sec for interactive applications and at 1,200 bit/sec for dial-up purposes on the asynchonous side.

For synchronous communications, there are Bell 208B modems for 4,800 bit/sec dial-up applications and Bell 201As for 2,000 bit/sec dial-up applications; ICC/Milgo data sets operate at 4,800 bit/sec for dedicated applications.

Additionally, the center has a line driver from Penril Corp. for 9,600 bit/sec local communications between buildings here, he said.

'No Question'

"There is no question the front-end processor takes the load off the mainframe it handles all terminal protocols and the detailed communications work.

"Without it, the CPU would be so overloaded it would die. Communications is a killer for the 1108 unit processor because it could interrupt for single characters," Shaver said.

Echoing Shaver, Ed Barkmeyer, a computer specialist in the Computer Services Division, said the Omnus frontend's advantage is exactly that it takes the interrupt load off the 1108.

"The CPU must service all of the time-sharing interface interrupts on characters it's a fairly sizable weight on the 1100 and the supporting minicomputers."

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NEW YORK – Com/Tech Systems, Inc. has upgraded its Secre/Data 102 series of data scramblers to provide 10 billion code combinations.

The Secre/Data Series H102 scramblers, which feature automatic cipher synchronization, allow users to select the code combinations by 10 thumbwheel switches.

The scramblers work with asynchronous communications lines operating at speeds up to 9,600 bit/sec and with synchronous lines carrying data at speeds up to 19.2 kbit/sec, a company spokesman said.

Interfaces for transmission rates up to 50- or 56 kbit/sec are also available, he added.

The automatic cipher synchronization feature is transparent to the computer system interfaced and is said to preclude the ability to obtain "key" information, even if known messages are transmitted.

The data scrambler is available for half- and full-duplex lines. A half-duplex model for synchronous communications with timing supplied by the user costs $1,750, the spokesman said.

Prices for other models in the H102 Series can range to $3,000, he added from 44 Beaver St., New York, N.Y. 10004.

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PTTs Called Virtual Monopolies

Public, Private Nets Seen Vying for European Users

By John P. Hebert

Of the CW Staff

NEW YORK – The interaction between public and privata data communications networks in Europe will influence the market structure of future information systems there, according to Louis Pouzin of France's Institut de Recherche d'Informatique.

There is no equivalent to the U.S. Federal Communications Commission in Europe, Pouzin said at a recent conference here. Instead, each country has a postal telephone and telegraph (PTT) authority which not only makes the regulations, but is that nation's common carrier of data communications facilities.

The body best qualified to formulate standards for European data communications networks is the PTTs, in the opinion of Phillipe Picard of the French PTT.

The European PTTs, which are in effect monopolies, charge a flat rate of $2,400/mo for the use of communications lines plus an additional traffic charge of 25 cents per message/mo, Picard said.

"A monopoly implies rights, but it also implies obligations," he added.

There are three categories of organizations which could bring about standardization – users, manufacturers and the public communications carriers, he said.

Users don't have the power to impose standards, nor do small manufacturers of data communications products; the large manufacturers, Picard said, usually don't want to impose the power they have.

There are few private networks for dedicated purposes in Europe at present, Picard noted.

"The main problem with private networks," he continued, "is with getting approval of data communications equipment, especially that of complex equipment."

Private Nets on Increase

David Mann of the English firm of Logical Ltd. told conference attendees the number of private data communications networks is steadily increasing. This trend will continue unless there is a radical policy change from the PTTs, he added.

The demand for private networks comes from a number of different forces, according to Mann, including the need for better facilities and lower costs and a desire for more standardization and control in "total systems".

The PTT tariff costs are the greatest motivational factor in building a private network, in addition to being one of the big advantages of a shared network, he said.

In the future, changes in tariff structure to make shared networks more attractive will be evident, Mann predicted. The PTT's prohibition of such activities is no good because the PTTs cannot offer better service, he said.

Unfortunately, Mann said, because of PTT inadequacies of service offerings resulting in the increase of private networks, there is unnecessary duplication and more inflexible design.

This, in turn, is resulting in greater pressure for more coordination and standardization of data communications networks.

The private networks act as a catalyst for better service from the PTTs, which do not want to lose network subscribers he said.

Another speaker on the anti-regulation side of the fence described the shared network facilities of the Societe Internationale des Telecommunications Aeronautique (Sita).

The Sita network is a "unique animal": it not only has the privilege of transmitting over international European networks for shared use, but it has to keep it, Sita's Pieter Kroneberg said.

"Do we (private networks) have the right to continue to operate the private networks and pay administrative bills but have the (PTTs) leave us alone with our own procedures?" he asked.

"I would say the government has a given right to say what standards will be imposed, but how far it should go on monopolizing private users is the question," he said.

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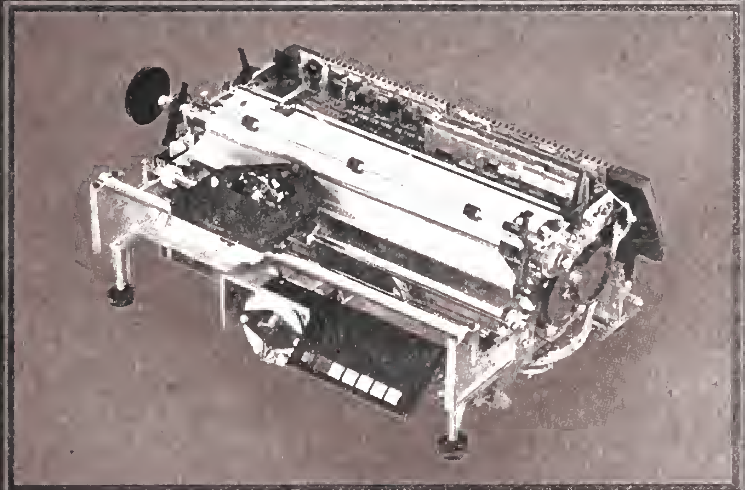

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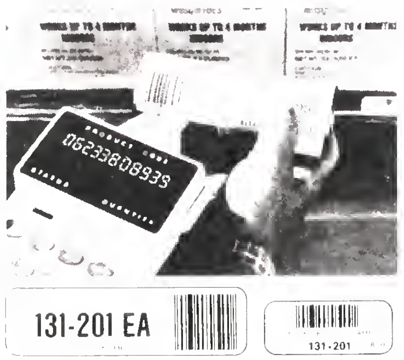

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It automatically recognizes both types of UPC (A or E) then reads and calculates the check digit for verification. ULTRAPHASE interprets the bar codes and translates them into digits. The item numbers appear — bright and large — on the LED display as fast as the probe reads the code. If an error is detected, an "E" flashes in the status position and an alarm sounds. When everything is correct, an "A" for "Accepted" appears. The scanning is done without turning on a switch. ULTRAPHASE has no power on/off switches for any procedure. It turns itself on when needed, off when finished.

It remembers.

After the bar code is read, you enter the quantity and ULTRAPHASE remembers both. All entries appear on the display for visual verification and are stored in the removable Memory Pack. At any time, stored information can be recalled and displayed since ULTRAPHASE remembers exactly where each entry is. You can review the entire contents of the memory, or may search for a specific item or group of items. ULTRAPHASE keeps track of the unused memory and informs you on request. Current memory capacities 4000 (4K) and 8000 (8K) characters are available and interchangeable.

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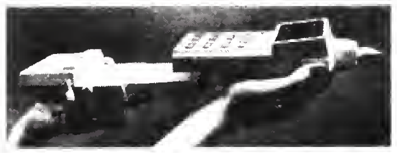

It speaks.

When you are ready to forward information to a processing center, you simply slide out the lightweight Pack and insert it into the service module. Dial the center, press the transmit button and your information is sent at 120 characters per second. Transmission status is monitored and indicated on the service module.

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ULTRAPHASE is now available in limited quantities. For information please write or call Ronald W. Zolkiewicz, Vice President of Marketing, (213) 549-4040.

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DATA ENTRY

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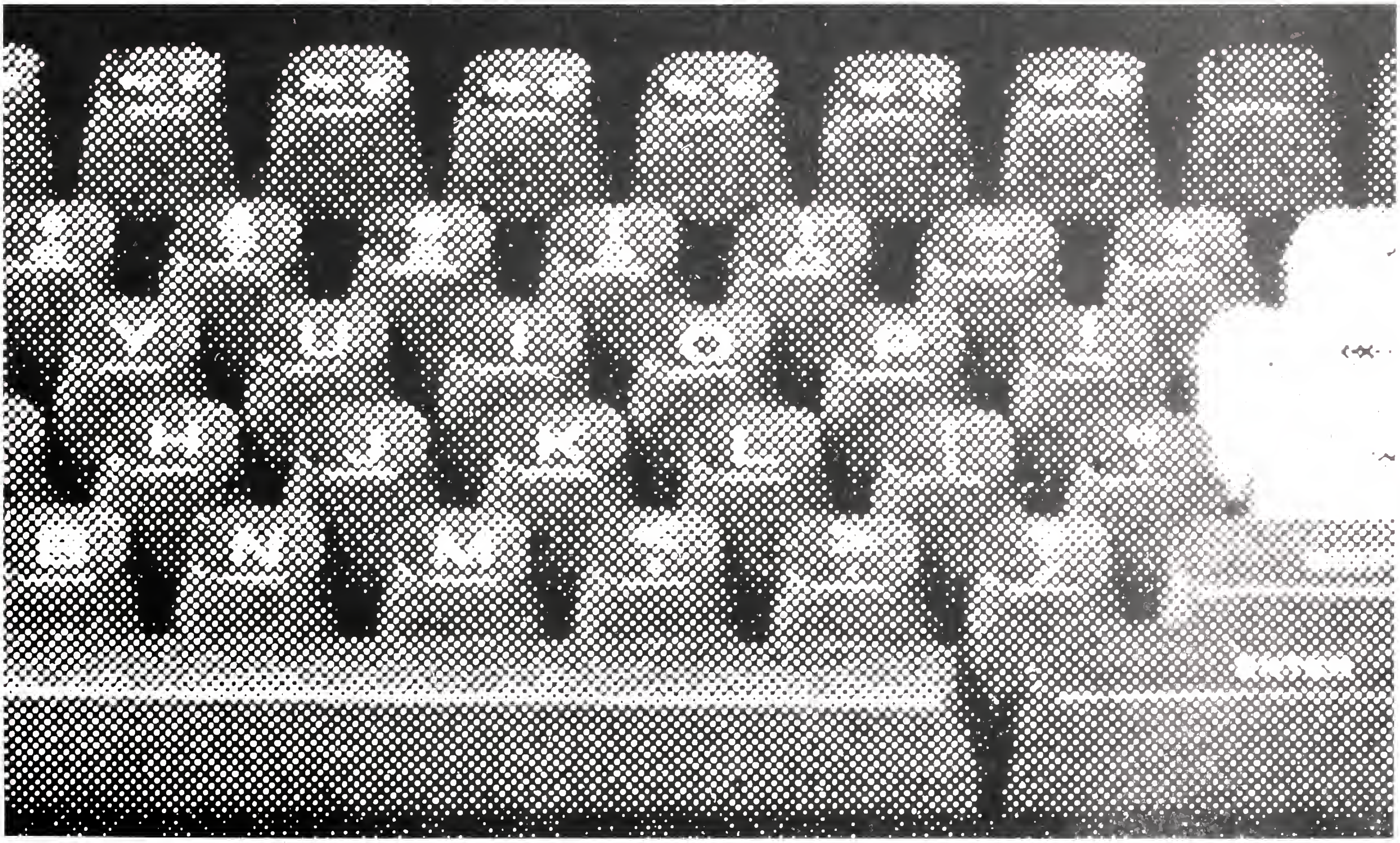
A Computerworld Special Report JUNE 28, 1976



Can Aid Physically Handicapped

Man/Machine Interface Utilizes Human Brain Waves

By John P. Hebert
Of the CW Staff

LOS ANGLES — A team of researchers here has taken a step into the future by experimenting with a direct brain-to-computer interface.

Five years of experimentation with the man/machine interface which links a person to a computer system by utilizing the brain's faint electrical activity manifested on the scalp, has yielded impressive results, according to Dr. Jacques Vidal.

In some cases, experimental subjects have moved a visual object electronically through a maze on a CRT screen with up to 97% accuracy, he said.

The method by which this is accomplished is not to be confused with a person thinking an object through the maze: "It is not thought which moves the object, it is a mental set," according to Videl, head of the Brain Computer Interface project of the University of California at Los Angeles (UCLA) Computer Science Department.

Drawing a fine line between brain activity and thought, Vidal said he and the other researchers "trying to demonstrate a visual keyboard or light pen" where a "master" directs his gaze to a particular learned spot on a CRT screen, which acts as stimulus for the symbolic object.

A computer system decodes the associated brain wave activity, which then serves as a "command" to move the object, he said.

Beneficial Applications

The $100,000 per year experiment could have harmless and beneficial applications, Vidal said, noting some were concerned with the implications of the experiment.

"One application directly in mind," he said, "is in the case of cerebral palsy victims, where there is no motor control, but eye control. One can sense what the subject is looking at, " he said, but there is little communication beyond that point.

The man/machine interface can provide the motor link between this person and his surroundings, Vidal indicated. "Direct brain-to-machine commands can be of obvious practical importance in the case of dysfunction, saturation or emergency situations," Vidal said.

Asked whether he thought the interface might ever be used in dangerous situations, Vidal said, "nothing should ever entirely rely on it."

The U.S. Public Health Service indirectly provided the initial funding five years ago with money left over from another grant it had given to UCLA, the project head said.

Current support comes from the government's Advanced Research Projects Agency (Arpa) and also from the National Science Foundation.

A real-time computer link from the subject to the computer system forms an electrical one-way street with the human providing the input.

Visual stimuli, in the form of computer graphics on a CRT screen, provides the experimental subject with what Vidal called one side of a dialogue in a neurocybernetic loop.

During the experiment, the person sits in front of an Imlac PDF-1 CRT graphic terminal in a booth in a soundproof room, Vidal said.

A multifield display is presented to the person on the terminal screen for 100 msec with a red light spot serving as a reference point to direct the eye to a directional arrow. (Four arrows are used, representing up, down, right and left.)

These brief visual events are recorded on different positions on the retina , and the neural messages are sent to the visual cortex of the brain where they produce "ripples", he said.

The resulting "whole brain" neural activity is recorded for 300 msec by six small electrodes positioned on the scalp in exactly the same way electroencephalograms (EEG) are used to record brain wave activity.

The information is sent to UCLA's Xerox Data Systems F-930 computer system via a high-speed link passing through an audio amplifier which magnifies the faint signal between 500,000 to 1 million times, Vidal noted.

Related story on Page S/4.

Signals are processes in real-time, he said, with 80 samples of activity recorded for each of the five incoming channels. The resulting 400-dimension vector is reduced by a step-wise discriminational analysis to 10 best signals which are ultimately selected to represent a particular direction, he said.

The system then shows the subject the result of his brain wave activity and the subject learns that directing the gaze in a particular direction will correspond with a certain directionality.

The group of engineers and neuroscientists who developed the process have taken "average subjects" and brought them up to an 80% correct response rate in moving a symbolic mouse through a maze on the CRT screen, with little training, Vidal said.

Movement as Stimulus

The next research phase, he added, was to use movement as a stimulus.

Meanwhile, Arpa (which volunteered funding support for the project) is trying to promote similar experiments with aircraft simulators at the University of Illinois, Vidal said.

Asked what the possibilities of this further experimentation might be, Vidal said it could be used by a pilot-to-computer system link for evasive action, for example.

He said it could be used in emergency situations such as this, "but not to pilot the plane."

Regarding recent "misrepresentation in the press" Vidal stressed that the link is not directed from the computer to the human.

"It's directed the other way. We're talking about man controlling machines," he said.

Eliminating Keypunching, Hand-Written Documents Seen as Cost Advantages of Voice Data Entry

By John C. Collins
Special to Computerworld

Current designs for computer-based systems are strongly emphasizing a decentralized approach. The ability to allow a department of a total organization to have control of its own computer system and use it to more effectively run its part of an overall organization has come to the forefront in computer operations.

This decentralization has been made possible largely by technological progress with heavy emphasis on intelligent terminals, minicomputers and microprocessors. Since the combination of these capabilities allows the user more terminal capability for less dollars, the desired effectiveness of decentralization can be achieved in a cost-effective manner.

This present trend toward decentralization and the resultant dramatic increase in terminal use has pushed the cost of capturing and recording data input to a major portion of total computer system costs. The net result is an increasing awareness of the labor costs associated with data entry.

Electronic systems are now appearing which allow one to "talk" information directly into a computer with no intermediate keying or hand-written steps involved. Machine communications are simplified since the operator provides instructions in his natural language; spoken commands then are automatically recognized by the voice data entry terminal.

Our firm has developed and is delivering automatic voice data entry terminals. This terminal is about the size of an ordinary suitcase.

It consists of a small microphone headset, connected either by wire or wireless transmitter to a speech recognition terminal, where the words are analyzed and identified — depending upon an application — and may include a teleprinter, visual display, standard output to a computer, electronic control link to an electromechanical system or a combination of any such computer peripherals. The voice data entry terminal appears as a keyboard to any other host system.

Most applications require a vocabulary consisting of about 30 to 50 words, but the terminal can be made to handle 200 or more words or short phrases simply by adding to the modularly expandable memory of the speech recognition processor. The entire system is programmable so individual words can be changed at will and the whole vocabulary changed to another application by the user.

The only equipment located in the work area of an operator is a small remote control console which can include a visual display (automatic voice response is used in the case of wireless inputs from an operator entering data from many different locations). The speech recognition unit can be located up to 1,000 feet away and can be interfaced with an existing system using one of its channels.

Operating Procedure

When an operator is assigned to the voice data entry terminal for the first time, he must "train" the speech recognition system to recognize his voice by repeating each word in the vocabulary 10 times. The parameters of pronunciation for each word are then filed in the speech recognition processor's memory for later matching and identification. After this initial training, data is obtained from the operator; he need not retrain each time he uses the system.

Since the system stores the voice characteristics of each user, dialects, accents or different languages can be recognized by the speech recognition system. A Spanish-American operator for example, can train the system to recognize his "ocho" for the number "eight." Also, since the system analyzes speech features that are invariant to the day-to-day changes, head colds, sore throats or hoarseness normally will not hamper the recognition of the operator's speech.

By the use of a visual display at the operator's work area, an indication is given to him of what has been recognized by the machine. In this manner, the operator verifies a block of data entered for a particular operation by visually examining the display.

Should he detect an error, he uses a word such as "erase" and reenters the correct data. If the data on the display is correct, he simply indicates this fact and enters the data as a valid entry by saying the word "okay" or "go."

In normal data entry applications, information is entered in one of two ways. A turnaround document is key entered or a person records information at one station and passes it along to a key entry section which enters the data into the computer system. In some applications, there is minor handling of documents.

In others, because of the nature of the document which provides the basic information there is a requirement for the person who captures data or key enters data to use his hands to arrange, leaf through or select various pieces of paper for data entry.

Voice data entry is particularly effective in those applications where there is a handling requirement as well as key entry or those areas where one station manually records information and the second station key enters the data.

The use of voice data entry can, therefore, allow a person to use both hands and eyes to handle documents while simultaneously entering data directly into a computer system, provide voice data entry to the station that would normally record the data, eliminate the need to

(Continued on Page S/3)

On the Inside

Man/Machine Interface Utilizes Human Brain Waves S/2
Cost Advantages Seen in Voice Data Entry S/2
Voice Entry Allows 20/ Cut in Quality Control Staff S/3
Intelligent Units Reduce Personnel by 100 Positions S/4
Language of Human Brain Called Natural DP Code S/4
Optical Mark Readers Aid Insurance Firm's Accounting S/6
Input Subsystem Improves State of State Finances S/7
New Uses Seen Rejuvenating Concept of OCR in '70s S/8
OCR System Expected to Cut British Health Plan Costs S/10
Key-to-Disk Improves Store's Throughput 20% to 40% S/11
Incentive Plan Boosts Department Performance 30% S/13
Optical Mark Readers Help States Meet Report Regulations S/13
Ordering Units Allow Salesmen More Time for Selling S/15
Hospital Finds Key-to-Disk Cure for Work Pileups S/16

This special report was prepared under the direction of Editor E. Drake Lundell Jr. Cover art by Cynthia L. Kintzer.

Voice Entry Allows 20% Cut in Quality Control Staff

By Esther Surden
Of the CW Staff

CHICAGO – Using voice data entry for quality control at Continental Can Co., Inc. here has allowed it to eliminate in the neighborhood of 20% of its inspection force, according to Thomas H. LeMay, director of quality assurance for new products and methods for the Metal Operations Division.

The systems are being used by inspectors of pull-ring can lids, LeMay said.

Two other alternative means of accomplishing this goal were considered, LeMay said. The first, to record directly into a computer with a digital readout would have required new, expensive equipment. The second, which involved redesigning the measuring gauges, was tried and is working in several Continental plants, he added.

Uses Existing Gauges

Voice data entry was chosen for this particular application because it uses the existing gauges, and data could directly enter the system without changes in the way things were being done, LeMay continued. The inspectors could still use two hands to perform their complicated calculations, he added.

The voice system eliminated all the previously used data recording forms, reducing transposition errors, recording errors and the recording time which represented up to 50% of the inspection effort, he said.

The system at Continental has a two-line visual display that indicates the current state of the inspection process and prompts the inspector through his sequence. The upper line of the display indicates the current step, and the lower line displays the data which the inspector enters by voice command. The system was designed by Threshold Technology, Inc., a Delran, N.J. firm.

The operator is alerted with both a reject light and a "beeper" to indicate when an out-of-tolerance measurement is encountered.

The operators can also use various meters and gauges in the order in which they become available from other inspectors, according to Threshold. If an operator wishes to deviate from the normal sequence, it is possible to advance to another data entry field while preserving the current inspection step.

Summary Report

When all the data has been entered, the system prints out a summary report showing all the defects in the proper categories, Threshold said.

At Continental, the output is taken and entered into an IBM 370 for monthly analysis and summary, LeMay said

LeMay saw a demonstration of the voice entry systems at O'Hare airport here where they were being used for baggage-handling purposes and thought he could use them for his application, he said.

The system is operating controlling 24 conversion presses in one plant. Continental is in the process of extending it to two more plants for all the variable control measurements of the beer and beverage lids, he added.

The Threshold 500 systems at Continental include 4K of random-access memory and cost $10,500 each. They are connected to a host Data General Corp. Nova minicomputer with 24K of core. The system was configured as a turnkey for Continental.

The system takes about a week to get used to, LeMay said. The inspectors are working on it within three or four hours, but it takes about a week for them to build up to speed. A video tape training film was used for the initial training, he said.

The system has been very reliable. The Threshold people have been down to take care of problems three or four times, LeMay said, but most problems are taken care of over the phone.

Speech Recognition Seen Offering Users Many Cost Advantages

(Continued from Page S/2)

manually write the information down and eliminate the key entry activity entirely.

In these situations, there are three major advantages of voice data entry:

- Improved Operator Productivity. Direct cost savings can result from either increased productivity or labor savings of subsequent keying operations which usually follow initial manual data recording. Indirect savings can result from elimination of training (since relatively unskilled personnel can use speech recognition systems). Usually the cost of generating a handwritten document in the proper format for a keying operation is three to four times the amount spent in the actual keying process.

The cost of voice data entry terminals reached the point early last year where the cost of the terminal equipment is less than the annual cost of a human operator. This has broadened the applications potential substantially to the point where productivity increases of 20% to 30% can economically justify voice data entry systems.

- Operator Interaction. When speech recognition systems are employed in data entry systems, all the advantages that can be realized from source data capture are incurred. Only a single individual is responsible for the accuracy of the data being entered since no intermediate operators or steps are required.

Real-time feedback, either visual or aural, can guide the operator through a complete sequence and can allow for error correction by control words such as "erase, cancel" and formatting by control words such as "tab, line feed."

- Operator Mobility. By the use of a wireless transceiver an operator can have complete freedom of movement and still communicate with a speech recognition system.

The first speech recognition systems to be used by industry in various applications were installed by Threshold Technology, Inc. in the early '70s. The results from these initial operating systems indicate that a factory worker with minimal training can use a speech recognition system quite successfully.

Recognition accuracies obtained were equal to or superior to keying accuracies obtained from the same personnel.

Collins is a vice-president at Threshold Technology, Inc. in Delran, N.J.

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Intelligent Units Reduce Personnel by 100 Positions

ANN ARBOR, Mich. While a network of intelligent terminals has remained transparent to Chrysler Credit Corp. account customers, it has reduced the company's data entry personnel requirements by over 100 positions.

The Sycor Inc Model 350s are located in 115 North American Branch offices to process new accounts and delinquent information.

Chrysler's Car/Retail system, which maintains up-to-date records of outstanding retail vehicle accounts is built around an IBM 370/145, which operates under OS/370 and VS/370.

The key to the system is the rapid movement of information which supports the fundamental, yet often elusive, principle of "management by exception," according to J W. Bolin, manager of systems and computer services at Chrysler Financial Corp. (CFC) headquarters in Troy, Mich.

To date, the system has eliminated the posting of branch-maintained ledger cards on routine payments, removed many tedious repetitive jobs from branch responsibility, including most of the frustration of looking for lost or misplaced ledger cards; and relieved the branch offices of much manual effort by centralizing and mechanizing the computation and maintenance of delinquency control records at the home office.

The system has also improved profits by more efficient use of people's time and uses of modern equipment for branch assistance where practical, Bolin said.

To achieve its objective, the Car/Retail system exploits the current technology of the computer and communications field, Bolin said, including the employment of optical scanning for the translation of retail contracts into computer-processable files; the use of satellite computers in Atlanta, Detroit, Los Angeles and Philadelphia linked to a large home office computer; and the use of microfiche for both temporary and permanent branch office records.

In addition, the system uses a national time-sharing network for daily processing and communication to and from branch office teletypewriters and the home office computer, he said.

The retail master file, prior to conversion, was updated with all transactions on a once-a-month basis. It consisted of 30 reels of tape and required 14 hours of computer time for updating.

Daily updates are now running in about four hours almost precisely the objective established prior to conversion, Bolin noted.

Prior to conversion, the U.S. branch offices received the customer's payments and payment stubs, deposited the funds locally, posted the transactions to ledger cards and sent the payment data via U.S. mail to financial headquarters, he said. Headquarters then had to duplicate posting efforts to update the master account files on computer tape. The determination of individual customer account delinquency was made at individual branch locations by the daily review of ledger cards.

The ledger cards were then used for the manual preparation of late notices, collection followup and delinquency statistics.

The actual conversion of U.S. branch locations was accomplished in six months, beginning in June 1972, Bolin said.

First, an internal task force primed the branch managers and their staffs as to what was coming, why and how it would make life easier for all concerned by conducting seminars for each of the four major areas of the company, he said.

Informational manuals were developed to educate those who would be involved in an attempt to bring everyone on board as quickly and enthusiastically as possible.

Second, the company's customers were advised that, effective with their next payment, their checks should be mailed to a new area data center address. Four such centers were established in Detroit, Philadelphia, Atlanta, and Los Angeles, each with its own satellite computer.

The objective was to receive mailed payments from customers on a timely basis as well as efficiently process the payment data and funds, according to Bolin.

Third, teletypewriter terminals were delivered to each branch office, bringing them instant access to a national time-sharing network via local telephone dial-up. Each branch and regional data center accesses the Car/Retail system on an as-needed, right-now basis to receive relevant account information such as payments received on delinquent accounts, average daily delinquency statistics, repossession statistics, revised terms and so on.

The key here is the word "relevant," according to Bolin. One extremely important aspect of the entire system is that it emphasizes "exception reporting," wherein each branch can now concentrate on the unusual customer payment history rather than wading through all outstanding accounts to determine the status of the very few, he said.

In May of 1973 the system was extended to permit communication from branches to the home office via the branch teletypewriters and the time-sharing service.

The time-sharing network collects, balances and stores account data from the branch locations at the time-sharing computer center until Chrysler is ready for the daily updates of its internal master files. The new data is transmitted into the company's computer using high-speed services at 2,000 bits/sec which allows transmission of up to 600,000 8-bit char/hour.

Last August, the company began installing a network of Model 350s, known as the Branch Intelligent Terminal System (Bits) to take the place of a currently installed optical scanning systems and a teletype-writer/time-sharing system, Bolin said.

The Model 350s now capture, edit and balance account activity (previously processed via the teletypewriter/time-sharing system) which affects the status of an account, he said. This information is transmitted directly to the home office computer center where it is combined with payment data from area centers and is used to update the company's master files.

Resulting information is transmitted back directly to the Model 350s in each branch location.

New credit contracts are manually prepared in branch offices and contract information in hand written onto machine-readable documents, which are then mailed to CFC headquarters for optical character scanning, Bolin said.

Computerized, the data is edited, verified and reviewed for the inclusion of alphabetic data via on-line video display terminals. The record is then processed through a subsequent edit run and finally a master record is created, as well as a coupon book and account card, he added.

With the Model 350s, the hand preparations and optical scanning are being eliminated. When the customer has been approved for credit, contract information is typed into the terminal.

Calculations, edits and crossfooting of money entries are performed by the terminal, Bolin said.

As the procedure on each contract is completed the information is stored on the Model 350's diskette, then transmitted nightly to Detroit for processing on the 370/145.

All the benefits of the previous system remain according to Bolin, with three improvements: branch capacity to handle new business activity has been increased; communications with the central computer center are direct; and productivity has been increased and corrections minimized by capturing data at the source.

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Language of Human Brain Called Natural Data Processing Code

BOSTON "There is . . . at least one natural information processing language: the internal language of the human mind.

"Once the neural language of human thought and memory has been decoded, it will be possible to program a computer in it and to transfer programs directly to the computer from the appropriate neurons of the human brain."

These thoughts were given by Dr. Adam V. Reed of Rockefeller University to persons attending the annual meeting of the Association for the Advancement of Science here earlier this year.

The optimal development of the computer, in terms of its users, is "still several decades in the future," the scientist who is currently involved in work aimed at deciphering the internal processing code of the human mind, said in his presentation, "Brain-Computer Hookups: The Ultimate Usage Mode of the Indefinite Future."

Extension of Natural Brain

"Ideally the computer of the future should be an electronic extension of the natural brain . . .It should share with the brain the implementation of the informational processes which we think of as our minds," Reed said.

"It should also cease to be an external, consciously manipulated artifact and become no different, from the user's view point than any natural part of his brain.

"Physically, it should make contact with natural neurons for both input and output without interfering with their normal operation.

"Input from computer to brain will probably follow from technology currently being developed in the area of neuroprostheses for the blind. Prostheses currently being experimented with reach only the surface of the brain, making no contact with individual neurons," Reed said.

"However, it is obvious that much better performance can be obtained by stimulation of individual neurons in the patient's visual field, and this is the direction neuroprostheses work is likely to follow.

"The limiting factor in the development of directly linked computers," Reed said, "is likely to be our knowledge of the location of relevant neurons and of the internal code of our minds."

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Eliminates Much Paperwork

Mark Reader Net Aids Insurance Firm's Accounting

CUPERTINO, Calif. – A nationwide data collection and communications network of optical mark readers has helped at least one insurance company here meet its cash accounting needs.

The National Life and Accident Insurance Co. is using more than 200 Hewlett-Packard Co. (HP) Model 7261A optical mark readers to eliminate the time-consuming accounting operations previously performed manually in its field offices.

National Life ranks among the 20 largest insurance companies in the U.S. with 254 district offices in 27 states. These district offices communicate directly with the home office in Nashville, Tenn., supplying data on the transactions conducted with the company's 8 million policyowners.

In the past, this accounting operation was performed manually at the end of each month. Throughout the month, each agent recorded his customer transactions in a large collection book, which also served as the policyowner premium accounting record for the company. Collections from 50 to 130 accounts were recorded daily in this way by the salesman.

At the end of each month, the agent was obliged to compile these numerous transactions and balance his accounts. This process not only required several hours, but the agent had to recall numerous transactions which occurred during the month, leaving National Life with the difficult task of making important management decisions from manually derived information.

This problem has been solved with the installation of field communication stations in each of the National Life and Accident offices. These stations consist of an HP Model 7261A optical mark reader interfaced to an "intelligent" communications terminal, according to L.H. Stevenson, director of data collection and communication systems.

"By using optical forms, this data collection system meets National Life's requirements for a simple, versatile and accurate data entry tool. It has allowed us not only to improve the monthly reporting, but also to establish a daily accounting and record maintenance system," Stevenson said.

A computerized system located at the home office prints optical sales and service documents that include policyowner information in both visual characters for the agents' use and binary codes readable by the machine.

Two Forms Used

Over 90% of all National Life's transactions require the use of only two different forms, the weekly premium and monthly account documents.

These two forms are printed under computer control to include the name and address of the policyowner, details of up to nine weekly or monthly policies, total account premium, a calendar of 36 weekly or 12 monthly due dates and an individual account number.

When the agent collects an account premium, he enters a pencil mark on the account document calendar to indicate the week or month through which premiums are paid. After the agent has visited his policyowners to collect premiums, he delivers the optical cards, along with the payments, to the district office. There the cards are read through the optical reader into the terminal.

Each district communication station is equipped with a mark reader and an intelligent terminal with cassette storage. The terminals communicate with the home office data center through telephone Wats lines.

Unattended Operation

At the end of each day, with all transaction data stored on cassettes, the terminal is set for unattended operation. Early in the evening, the home office data center automatically calls each district office in turn, activates the terminal and instructs it to transfer all data on the cassette. The computer then uses this information to update company account records.

Before morning, the data center again calls the district offices and transmits totals for each agent's collections of the previous day. Any discrepancies between the net-updated total and the agent's net deposit is tagged with error messages.

Account documents are then returned to the agents to be used for reporting future collections. When all premiums on a due date calendar have been reported, the document is automatically replaced by the home office.

"Thanks to this Inforex support team, we blew the competition off the road."

Dick Whalen, Director, Data Processing, Kawasaki Motors Corp., U.S.A., Santa Ana, California.

In the fast-moving world of motorcycles, you need all the support you can get. The kind an Inforex Support Team gives Kawasaki Motors Corp.

The team helped Director Dick Whalen select, set up, and train operators to run a data entry/communications network based on Inforex key-to-disc systems.

The network is nationwide. And it connects all of Kawasaki's eight regional offices including four warehouses to the Santa Ana office, which acts as control center for all invoicing and inventory.

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It's given them a tremendously streamlined operation. A fast 24-hour turnaround capability on all orders. And a definite competitive advantage. Which is just what they came to Inforex to get.

Besides service and reliability, what sold Kawasaki on Inforex was the very thing that sells riders on Kawasaki:

Performance.

The Inforex systems could do everything Kawasaki needed: parts orders, back orders, receivables, payables, warranty registration, warranty claims, whatever.

But the real kicker was the systems' ability to receive, transmit, or print *at the same time data is being entered.*

So whatever kind of system you want—data entry, remote batch communications, or computerized record keeping—we can provide it. Along with an Inforex Support Team to give you all the support you need.

Can Inforex really make a difference? Next time you're on the road, just count the Kawasakis.

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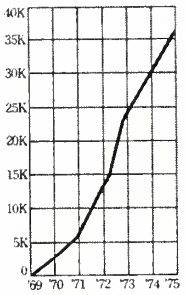


More keystations in more countries than any other data entry company in the world.

Inforex / Dept. 322/21 North Avenue / Burlington, Mass. 01803.

Input Subsystem Improves State of State Finances

LITTLE ROCK, Ark. – The State Department of Finance and Administration here has built its financial management system upon an input control subsystem featuring "automated documents" and user involvement.

Four key-to-disk processors control 53 keystations situated in user departments such as Income Tax, Motor Vehicles, Licensing and Administrative Services. The motive for installing the Mohawk Data Sciences Corp. (MDS) 2400 systems was to gain control over all incoming documents and remittances by assigning complete processing responsibility to functional sections.

Data entry and cash control operations are no longer centralized. Section managers now have tracking control over their incoming transactions from receipt through final, validated posting to detail accounts.

"Data entry is just one aspect of our input control subsystem. It's what is done with the information at point of entry that makes the difference between mere capture and a total system. We have always attempted to disperse our data entry functions by scattering key-entry devices throughout user departments," according to Berry Johnson, manager of data planning for the Revenues Division.

"Prior to the MDS key-display system and other procedural changes," Johnson continued, "we had key-to-disk systems that did little more than record what we keyed for transferral to the main computers. What was lacking was control over the records once they passed through the data entry cycle.

"It became very difficult to trace and cross-reference source documents, payments and account transactions, thereby causing a delayed or incomplete response to inquiries from taxpayers, auditors and section managers."

Automated Documents

Arkansas' present system converts paper documents (income tax and license forms, checks, etc.) to automated documents. Beginning as a manual procedure in each section, documents are first classified and assigned a system reference number. Cash amounts are also tabulated for batch balances. This sets the scene for data entry.

After source documents have been keyed to intermediate disk storage on the MDS 2400s, the documents are microfilmed and then destroyed to eliminate bulky paper storage. During keying, the system checks each record thoroughly for correct field ranges and extensions.

Batches are automatically zero-balanced to agree with preaudit totals. And, most importantly, paper documents are converted to machine records and formatted according to predetermined system requirements.

Source documents are usually designed for the people who use them rather than for the computer that must process the information. Source document control a turnkey feature of the MDS key-display system – completely reorganizes accounting data during the key-entry cycle. The feature provides accumulation, subtotaling and zero balancing by field, register, document or batch.

Instead of producing mirror images of input documents, source document control allows definition of entered data into system documents, with each element of the document individually accessible by the system.

Using source document control, a real relationship (not an artificial document-induced relationship) is maintained between fields.

Keyed fields may be applied to multiple purposes such as zero balance for one register and true accumulation for another register. The system effectively converts literal amounts to departmental values.

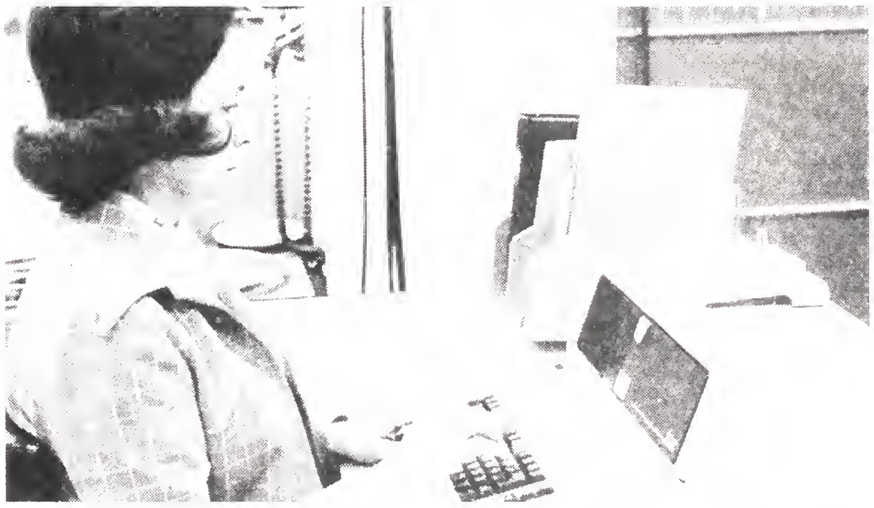
These automated documents are then passed on to central computing via magnetic tape to be incorporated into the data base file. The total system approach, from receipt of document to file update, ties each transaction into an easily retrievable and verifiable bundle of information.

"All the edits we can do during the entry cycle cheaper than on the central computers we do on the MDS systems. Automated documents become the focal point for reconciling source documents with our data base," Johnson said.

Income Tax Processing

Walter Skelton, assistant director of revenue services, is responsible for all incoming revenues (income tax, sales tax, license fees, etc.) and their speedy disposition via state treasury deposits and taxpayer refunds. His division is the primary source of revenue for all state agencies.

To establish control over his system Skelton distributed MDS keystations throughout the revenue building to give individual departments user control. The income tax section has capable people in all areas, cross-trained in data entry, microfilming and mail processing. In this way, responsible service is available at all times to the taxpayer, he said.

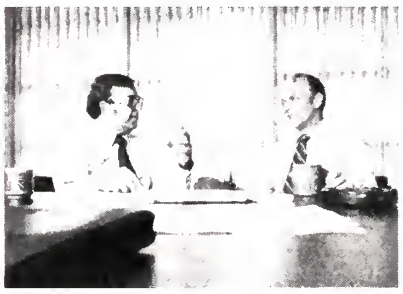

Input keystations situated in user departments are connected to their controlling key-to-disk processors.

Two MDS key-to-disk processors control the 36 distributed input stations at the Revenues Division; the third processor, partially reserved for backup, is assigned special applications such as remote job entry communications, report generation and custom-designed validation routines written in Mohawk Data Language (MDL). These MDL programs play a key role in the overall computer system.

"There are definite advantages to off-line editing for large volume processing" Skelton explained, "especially in revenue situations where imbalances are mostly taxpayer-induced math errors. By applying the backup processor with its MDL programs to front-end editing, we allow our key operators to concentrate on keying instead of checking for errors they cannot correct. Also, the backup processor performs many one-time, low-volume jobs which could not be cost-justified on the larger systems. This service has proven

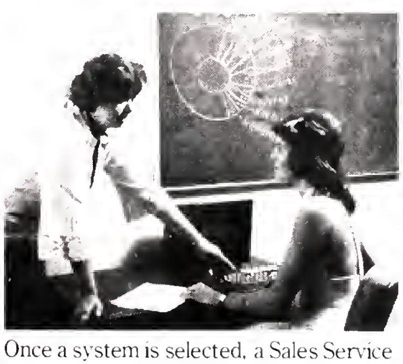
(Continued on Page S-10)

How the Inforex support team supports you.



An Account Representative such as Bernard Budnik will see to it that you get the best possible system for your application. He'll analyze your requirements, explain the options, and then help you select exactly what you need from our broad range of systems.

Next, a Field Engineer such as Larry Woodruff will oversee the installation and ongoing service of your new system. He'll do it fast, efficiently, and with a minimum of interruption.



Once a system is selected, a Sales Service Representative such as Jaye Lynn Towne will begin training the people who'll use it. It won't take long. Because all Inforex systems are designed to make the operator's job easy.

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New Uses Seen Rejuvenating OCR Concept in '70s...

By Fred Zirkle

Special to Computerworld

Introduced over 20 years ago, optical character recognition (OCR) was acclaimed by many to be the long-awaited solution to the data entry bottleneck.

OCR is essentially a 20-year-old technology being reawakened in a '70s environment to find obsolete, unfounded arguments against its usefulness clouding its future.

Originally, OCR was designed to function as an input unit. Unfortunately, most people still think of OCR as an input unit for photocomposition equipment.

Now OCR is used to drive the word processor thus gaining a new dimension and future in the world of data processing. If OCR has been around for 20 years, why aren't there more OCR installations which could automatically convert human readable data into computer-readable codes at speeds hundreds of times faster than the normal keying rates? Today the average OCR installation costs around $100,000. Many organizations cannot cost-justify this massive expenditure.

Selling the concept of OCR has not been a problem. Certainly everyone would like to be able to enter data as quickly and efficiently as possible (especially when 60% of the average data-processing budget is spent on data entry).

However, the reason most data processors do not convert to OCR today is their lack of confidence in its dependability as an input unit. This is mainly a carry-over of the problems encountered in the '50s by underdeveloped OCR systems.

OCR users now indicate they have achieved better then a 99% acceptance rate in error-reject situations, proving in fact that OCR can be a highly dependable system.

Operator Acceptance

Operator acceptance has been a suprisingly pleasant experience. Operators have expressed excitement over being able to increase their data entry rates by a factor of 20.

Even the successful OCR user is approaching a dilemma as distributive processing allows him to process data remotely, yet his OCR installation, which has cost-justified itself, is back at headquarters.

OCR has been required to enter data in such large volumes that it was not humanly possible. The speed obtained through OCR is now being lost as a result of mailing time. These same forms can now be processed at the branch by installing 50 small wands for the same cost as one major OCR system.

Factors in Data Entry

There are several factors in data entry that DP managers take into consideration before determining the type of system that would best suit their own specific applications and procedure methods. These are turnover, training, productivity, increasing volumes, time delays, errors and increasing cost.

In data processing the most immediate problem is speed (along with accuracy). Data processors are continually becoming more efficient and productive, but data input is not increasing its speed on an equal ratio, thereby creating data entry bottlenecks.

Everyone knows what data entry bottlenecks are, but not everyone knows how to solve the problem. A good analogy is a freeway traffic jam or "bottleneck" in which curves and turns slow down the flow of traffic. Each day new cars are being added to intensify the problem. Although the number of highways are increasing, they are not increasing proportionately to the influx of cars.

In essence, if one could control the flow of traffic by pacing each car and controlling each car's speed, one could eliminate any possibility of a traffic jam (of course an accident could unpredictably occur, such as in a data entry situation where an error reject occurs).

In data entry the problem is the same: too much data to be entered and not enough control or speed to handle it. One argument against OCR relates that in making source documents OCR-ready, a typist would have to be extremely careful, which involves not only extra time, but additional cost. This simply is not true.

In every situation pertaining to data entry, the information entered has to be correct, and the burden of this responsibility is going to fall on some individual within a company. OCR places this responsibility at the source.

A typist's speed is virtually the same on a data entry terminal as on a typewriter, even with the latest time-saving devices now being offered.

So, by reducing the necessary functions down to their most basic economical state, machine requirements can be reduced and the operator's function will become more specialized and effective. In other words, accept the facts, and take the time to make the source documents

(Continued on Page S/9)

It's 340 in Poughkeepsie,
350 in Des Moines
and 440 in Los Angeles.

SYCOR INC

...But Obsolete Arguments Against It Still Prevail

(Continued from Page S/8)

OCR-ready, and OCR will handle those bottlenecks while saving overhead dollars with its high throughput rate and versatile capabilities.

There are many other arguments against OCR, but for every unfounded argument there is a solvent, realistic answer, factually based on its proven user performance.

One pessimistic view to take at the first thought of converting to OCR is that all source documents would have to be printed in one of the OCR-recognized fonts, consequently limiting one to certain capabilities.

However, if this is examined in more detail, one will find this no longer applies as a valid argument against today's OCR systems.

Over 95% of source documents are rekeyed for data entry. Yet these documents must be machine printed, line printed, typewritten or hand printed. OCR capabilities can read fonts from daisy wheel printers, line printers, typewriters, embossed card encoders and even handprint.

Most of these source documents are rekeyed on any of the 500,000 data entry terminals in use today. On each of these terminals data entry speeds are limited to how fast the human operator can move his fingers.

25 Times Faster

Normal data entry speeds are approximately 2 char/sec. Without obsoleting present equipment or changing software, a user can plug an OCR system into his terminal and enter data up to 25 times faster. An operator with no prior training after 10 minutes can wand in printed material at speeds of over 50 char./sec.

Another concern is that the quality of print on the source document must be in excellent condition and well-maintained with the most care for future use. This too, is no longer true. As far as maintenance, those requirements would be no more than what is already involved in the standard method and procedure of an office filing system.

Not having to reorganize procedures and methods by implementing new equipment (which defeats the original intent of saving money) is an important concern to all potential OCR users.

OCR provides shorter processing cycles which helps to avoid unnecessary cost. OCR out performs an operator-manned keyboard on a 250/1 to 500/1 ratio. By the late '70s, 40% of the U.S. operational computers are expected to have data communication capabilities, but the major data volumes handled by this equipment will be using off-line methods for data entry. OCR is now used in off-line or on-line situations.

Wand Applications

By attaching a wand to a CRT the problems of accurate and timely entry are solved while lowering communication cost. While OCR has been used in some of these applications, the wand is most suitable as the hassle of one standard message form has been eliminated. Purchase price is also more reasonable.

The average $10 million company spends in excess of one man-month per year simply recording part number for inventory audit. The wand is ideal for scanning loose tags or lables attached to boxes and shelves. The document transport is ideal for high-volume reading of tags printed by line printer, typewriter or even handprint numerics.

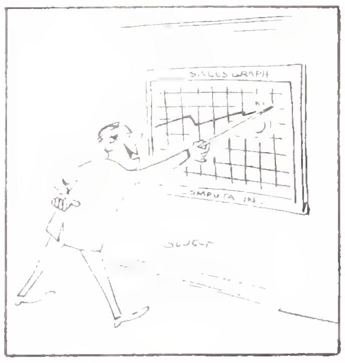
One percent of our gross national product is spent on actually handling cash transactions. Volume not humanly possible to record as well as time value of money dictating timely recording has made OCR a vital and successful means of recording this data.

Nevertheless, with distributive processing and time for mailing to a central site OCR is now within the reach of every branch office because of the wand purchase price. Some successful OCR users are presently considering installing 50 wand systems in remote sites for the same cost as their central OCR installation.

As more and more executive personnel are finding themselves on the keyboard the wand is ideal for entering at 50 char./sec, a rough draft for edit changes on the CRT.

With over 500,000 data entry terminals all limited by how fast the operators' fingers can move, the wand is an obvious complement.

[illegible] is president of the OCR Division of Key Tronic Corp.



'En Garde!!'

Now there's a family of distributed data entry and processing systems that you can tailor to the requirements of your remote sites.

If you've considered the advantages of distributed data entry and processing, you've probably discovered a sad truth:

A system that's fine for Poughkeepsie might be a washout in DesMoines.

Different sites have different needs. From remote data entry, to communications, to remote inquiry and response, to on-site report and forms generation.

And to overwhelm a small branch with high-powered equipment is just as bad as under-equipping a large one.

To match each of your branches with exactly the right equipment, in both hardware and software, there's only one terminal manufacturer to turn to. Us.

We're as flexible as you are.

Using our Sycor Models 340, 350 and 440, and their wide range of peripheral equipment, you can pinpoint capability to site requirements and price.

Our Model 350, for instance, might be just the ticket for your two-man operation in Des Moines. While a larger branch in Los Angeles might require the concurrent background processing capabilities of the Sycor 440.

And, while each of the three terminal systems has its own unique capabilities, they all work together in a remote processing network.

Each, for example, can be programmed with our high-level, easy-to-use TAL language. And, they not only talk to your CPU, but to each other.

And that means flexibility.

Should the requirements of one location change, our systems can change with them. You can switch terminal models without changing programs, or even retraining operators.

The Model 340.

For smaller office situations that call for data entry, you'll find our Model 340 the low-cost intelligent answer.

No matter which of its hundreds of applications you use it for—like order entry, payroll and accounts payable—you're assured of virtually error-free data every time. Because operator errors are pointed out immediately for on-the-spot correction.

And, its 8k bytes of programmable memory and capabilities like customized field validation, conditional data entry and arithmetic operations, mean the Model 340 goes even further in providing for needs you might not even have anticipated when you first got it.

The Model 350.

If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

Just key in a customer number and you get all the pertinent data: name, address and billing information. That means reduced keystrokes, improved accuracy and big savings.

The Sycor 440 System.

When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry/response concurrent with background processing.

Our 440 system lets you share and access files locally, reducing communication line costs and investments in central CPU resources.

Each display is controlled by the on-site processor and is capable of performing independently. At the same time that you're performing data entry you can make use of our special programs to produce a wide variety of management reports like sales analysis, inventory and billing.

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OCR System Expected to Cut British Health Plan Costs

LOS ANGELES The British government has begun using a computer system to "read" hand-printed forms filled out by clerks administering the national health plan.

It's estimated the system will scan and record data on some 2 million health care recipients annually; thereby cutting data entry costs.

The optical character recognition (OCR) system, known as Gratix 1, has completed final testing in the central office of the British Department of Health and Social Security (DHSS) at Newcastle-Upon-Tyne, England, and gone operational.

The computer-controlled reader was developed by Information International, Inc. (III) in Los Angeles. Gratix systems typically sell at a price of $2 million to $3 million.

In the first year's operation, the system is expected to read 1.6 billion alphabetic and numeric characters. During factory tests, the system achieved sustained recognition rates exceeding 150 char./sec reading mixed hand print and computer print, III said. Less than 2% of the characters were unread by the machine and required later human interpretation. The error rate was under .05%.

In the current application, computer-prepared forms are being used by some 1,800 clerks to fill out data on health care recipients. They hand print information on 11-3/4 in. by 10-1/2-in. forms, which then are microfilmed.

The film is entered into the system, which reads the microfilm page images, including both the computer-prepared line print and the clerk's hand print, and stores the character information on magnetic tape.

That tape transfers the data into the department's main data processing center. Thus, only the microfilm need be stored permanently, eliminating the need for paper archives.

Until now, all data supplied by the clerks had to be keypunched to create magnetic tape for computer processing. Part of this operation will be supplanted by the new system.

Because of the wide variety of people's hand-print styles, the system was designed to recognize more than one shape for most characters.

This means the clerks will be able to continue printing in their normal styles, rather than in an unnatural manner to accommodate the system.

"If Grafix 1 fails to recognize the character automatically, it stores a 'picture' or graphic representation of the unrecognized shape – maintaining an index of the character's position and the file from which it came," according to A.L. Fenaughty, III president.

"In a separate operation, the unrecognized image is presented to an operator on a CRT. Seeing the garbled letter or number in context usually results in operator identification. The character then is entered into the system through a typewriter-like keyboard," he added.

Input Control System Helps State Manage Revenues, Finances

(Continued from Page S/7)

invaluable for the smaller revenue sections which have little or no data processing funding."

"The data entry sifting process recycles the data until clean," Skelton continued. "Each batch of tax returns is assigned a unique transmittal key at the moment of departmental data entry. This classification scheme serves as the basis of all further controls.

"It allows our MDL programs to match income tax statements against check amount, to check that documents are balanced and in proper sequence for the main computer system and to more easily retrieve records from the data base files."

Arkansas' automated revenue informatin system can now account for all documents and remittances through the life cycle of any transaction. The best testimonial to the effectiveness of Skelton's system comes from a user – Robert Fortney, director of income tax. "With direct input to the computer system" Fortney said, "we are accomplishing more concurrently; i.e., getting a lot more done in the same amount of time."

"When the system was first implemented," Fortney continued, "we mailed a trial income tax form expecting to wait the usual months for processing. A few weeks later the refund arrived!"

"This state ceases to function if we fail to fulfill our DP responsibilities," according to Don Martin, assistant director of administrative services. "We are now more highly automated for the degree of auditing we perform," Martin continued.

"The state constitution mandates 100% audit for all fiscal matters. By interfacing key entry directly with our financial management system, we achieve the needed degree of control and freedom from errors.

"This state could lose substantial interest on millions of dollars to be invested or deposited in various accounts just because of a data entry bottleneck or a delay in funds transfer because of keying errors," Sandy Kyzer, supervisor of systems analysis said.

"We are putting more confidence in data entry," Kyzer continued. "The state has upgraded its mainframe programs to match the preprocessing capabilities of our key-to-disk systems."

"Now that we have the more sophisticated MDS systems, we're not limited by record lengths or hampered by throughput rates," Kyzer said. "The annual operating budget, for example, is our biggest job.

"We used to farm out 60% of it to service bureaus, but now we can accomplish all but 10% on our present system. Balanced, edited information is available prior to the first month's (July) report, and rejects are returned to agencies the following day."

"Cost estimates for data entry services have greatly improved, too," Kyzer said. "Arkansas legislators are asked to appropriate sufficient funds for an entire year of computing services. Operator productivity is the chief factor in determining these estimates.

"Formerly, budgeted dollars were based on an input rate of 7,000 keystroke/hour. Now we can count on 9,000- to 11,000 keystroke/hour for some applications, thereby reducing our appropriation requests significantly."

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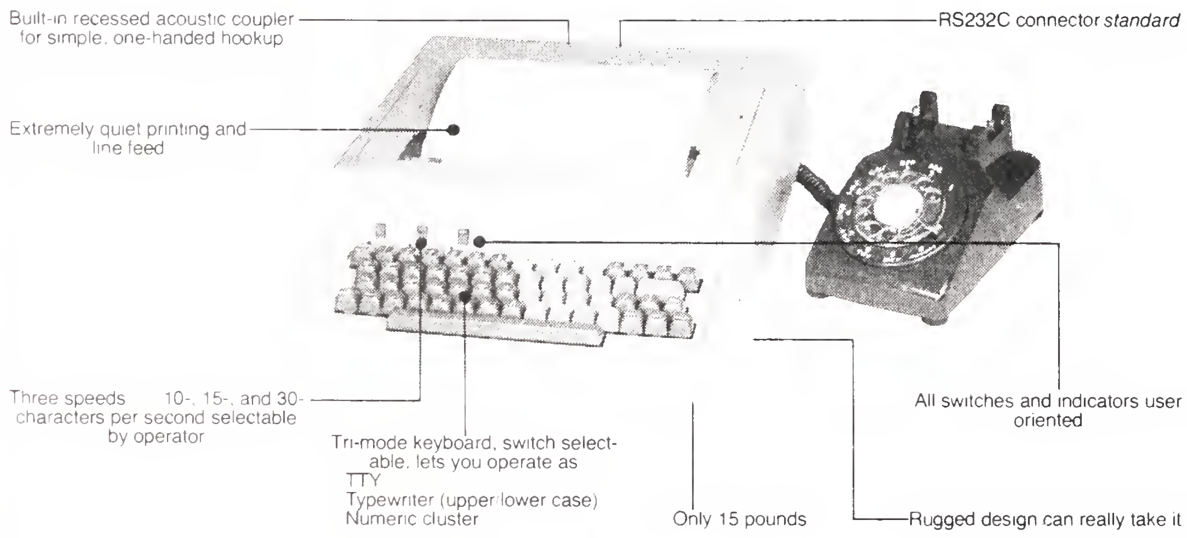
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Tri-mode keyboard, switch selectable, lets you operate as TTY Typewriter (upper/lower case) Numeric cluster
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Costs 30% Less Than OCR

Key-to-Disk Improves Store's Throughput 20% to 40%

HOUSTON – A 30% hardware cost reduction combined with a 20% to 40% increase in throughput and improved data flow have more than justified the acquisition of a key-to-disk data entry system for Foley's Department Store here.

"Using the source data processing capabilities of the Entrex system, "we've reduced anticipated data entry costs by 30%, according to R.J. Kennerty, divisional manager of DP for Foley's.

"In addition, our decentralized configuration allows us to edit data closer to the source," he said. "As a result, we've reduced errors substantially and increased throughput by 20% to 40% in all departments.

The key-to-disk system provides data control at the user department level, Kennerty added.

"At Foley's the user welcomes responsibility for data accuracy. Data is captured and edited by user clerical personnel, who are the people most familiar with the job. The end product has been cleaner data reaching our mainframe. Also, overall data flow is more efficient and reports are generated on time, Kennerty said.

Each month Foley's processes well over 200,000 transaction records, including 5,000 personnel records (10,000 during peak periods), 191,000 merchandise information systems (MIS) department records and 4,400 accounts receivable records.

The MIS volume represents a 200% increase over the past year, creating a real throughput challenge to Foley's data entry system, Kennerty said.

In addition to high-volume processing requirements, process flow timing is crucial to Foley's daily operations. For example, Foley's buyers rely on timely reports concerning merchandise flow and trends. Also, a sales audit report is critical to daily updating of the accounts receivable system, he noted.

A reliable method of data entry was required to keep pace with the increase in input volume and to meet tight output reporting schedules established by Foley's user departments, he added.

Optical Scanning Difficulties

Prior to information of the Entrex system, most data entry at Foley's was accomplished using an optical character recognition (OCR) page reader with OCR-A typewriter font input. Despite the fact the optical scanning system was very effective to process flow, Foley's DP personnel had pinpointed several major drawbacks in the system.

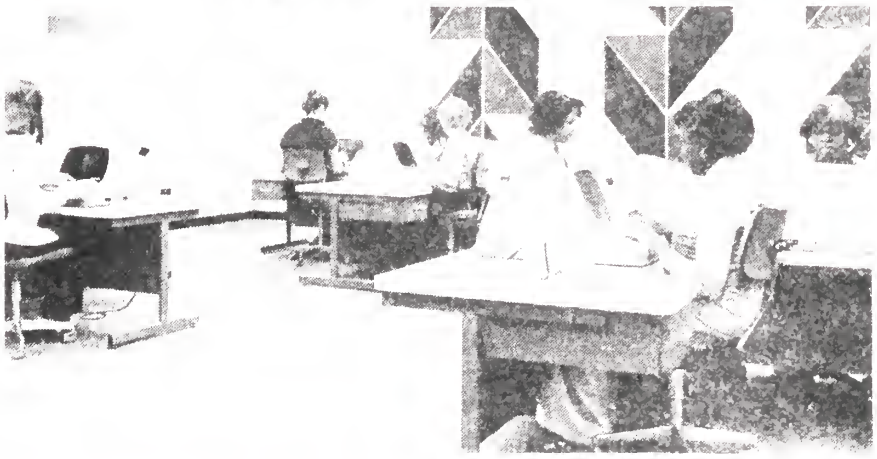
- A high document-rejection rate resulted from fluctuations in typewriter ribbon quality:
- Excessive paper flow stemmed from the fact each rejected document had to be retyped and reentered into the processing cycle from the beginning: typewriter to OCR to CPU. Because of the lengthy error-correction cycle, certain inputs had to be cut off at midday to allow sufficient time for recycling rejected documents.
- The lack of editing capabilities during the entry cycle meant all errors had to be caught in a mainframe edit run.
- Finally, the effective throughput capabilities did not permit meeting the processing schedules. A 200% increase in data input volume in the MIS department persuaded Foley's DP personnel to search for an alternative to the page optical scanning system, and to provide a backup reentry system for the electronic point-of-sale terminal system.

Data Entry Requirements

In examining alternatives to the optical scanning system, Foley's processing personnel defined the following data entry requirements:

- User orientation. The system chosen must be easily assimilated into the user's environment, i.e., the entry system should combine clerical job knowledge with high throughput capabilities.
- Easy conversion. The conversion from the existing system should be accomplished transparent to user clerical personnel, i.e., the system should not disturb the users' current understanding of their individual systems.
- Preprocessing capabilities. The system should provide data editing and validation capabilities to catch errors at the source and eliminate the need for repetitive corrections cycling and excessive paper flow
- Operational simplicity. The system chosen should provide simple English language data display to insure ease of oper-

(Continued on Page S/12)



Operators at Foley's enter data on key-to-disk units.

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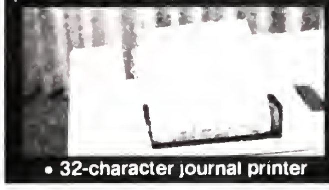

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Store's Productivity Increased 20% With Key-to-Disk

(Continued from Page S/11)

ation by non-DP personnel. Without memorizing mnemonics or complex error codes, clerical personnel must be immediately informed of keying errors.

- Source data control. Users must have complete control of their input, i.e., the responsibility for data accuracy must be placed at the source.
- Timely report generation. The system must be capable of meeting tight reporting schedules critical to Foley's process flow.

System Implementation

Foley's DP personnel examined key-to-disk systems from several vendors, including Inforex, Computer Machinery Corp. (CMC), Victor, IBM and Entrex.

"We discovered a basic functional overlap between all of the systems, but the deciding factor for us was the user-oriented design of the Entrex system," Kennerty said.

The key-to-disk system provides built-in English language prompts that keep an operator fully informed on all aspects of the entry process. No special codes or mnemonics have to be memorized, since all error and status messages are presented in simple English sentences, he said.

"For all the right reasons the responsibility for data accuracy would be in the user department. Consequently, the system chosen had to easily lend itself to our dispersed processing concept. Data should be entered and edited by the end users of the data, and in most cases this means by non-DP personnel," Kennerty said.

In October 1974, Foley's installed an Entrex System 480 equipped with a 9-track, 1,600 bit/in. tape drive and two 2.4 M-byte disks.

The System 480 CPU, located in the central computer room, initially supported 19 Data/Scope keystations, which were dispersed throughout the various user departments as follows: 10 keystations in the MIS department, three in personnel, two in accounts receivable, three in Sales Audit and one in the Computer Operations department.

"We converted from page optical scanning to the key-to-disk system with minimal disruption to user processing techniques," Kennerty said. "Paper flow between user departments and the DP operations department has been virtually eliminated. Data does not leave the user area; only an authorization ticket containing batch update information passes between the user department and our DP operations department," he said.

Users were quick to realize the advantages of entering their own data, Kennerty said.

"The new system provides user data control, which means data users have ultimate responsibility for data accuracy. To us, source data processing means source data responsibility. We have eliminated the errors of confusion that existed with conventional methods of data entry. The end result is fewer errors because of increased job responsibility and job familiarity."

Data Flow Improved

The system's ability to edit data at its point of origin has resulted in an immediate improvement in data flow, according to Kennerty.

"We now edit data as it is entered, which has allowed us to eliminate a time-consuming corrections cycle," Kennerty said. Eliminating the corrections cycle in turn has resulted in increased throughput.

"In all our departments, data entry throughput has increased from 20% to 40% simply because we have more time for input. Time formerly lost in the corrections cycle and in excessive paper flow is now devoted to throughput," he added.

For example, the MIS department now processes a 200% greater volume of data, using an additional five keystations. In both the Personnel and Sales Audit departments, up to 25% more data is now processed with no additional equipment, he said.

The key to Foley's increased throughput is simultaneous data entry and validation, according to Kennerty.

"The programming capabilities of the system, in conjunction with the system's built-in checks and edits, allows our users to enter data and simultaneously edit it on all levels – character, field, record and batch," he said.

For example, programs are written using the Entrex Editor language, which immediately detects errors and informs entry personnel of alternative courses of action in straightforward English statements. The key-to-disk system provides many validation/edit capabilities without programming, including value table and check digit validation, range checks and conditional verification, he added.

Additional Benefits

Several additional benefits of the system include the Operator Statistics feature, which provides an accurate assessment of operator productivity.

Stored in a program library on disk, operator statistics, including productive keystroke rates broken down by job or by individual operator, offer the user an effective data management tool.

Also, the system produces an audit trail on tape containing all input forwarded to the IBM 370/145. Generated via an Editor program, the audit tape provides an excellent means of backup in the event of mainframe or key-to-disk system failure.

Finally, Foley's DP personnel have written an Editor program that automatically ages data batches on disk. Using this aging information, operations personnel inform users of when to delete batches from disk so that disk storage may be maximized.

Last November Foley's installed an additional dual-disk System 480, supporting five additional keystations in the MIS department and eight keystations to be used for the new accounts payable/merchandise invoice control system. Future applications for the second System 480 include a refund control system, a price revision control system and a staple stock input system.

"To my way of thinking, the advantages of source data processing are two-fold. First, there is economics. It saves both time and money to capture and edit data once. At Foley's source data capture has eliminated a very costly corrections cycle and the excessive paper flow.

"Secondly, source data processing has allowed us to fit the system to our existing work environment.

"Consequently, the people who know the job's parameters are the ones who enter the job.

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With No Loss in Data Entry Accuracy

Incentive Plan Boosts Department Performance 30%

Special to Computerworld

CONCORD, N.H. Implementation of an incentive system led to a 30% improvement in performance in the Blue Cross/Blue Shield data preparation department here.

Blue Cross/Blue Shield of New Hampshire and Vermont has been using two Mohawk Data Sciences Corp. (MDS) 2400 key-to-disk systems for its data preparation operation since November 1972.

The MDS software produces two statistics which help the department manager, Carol Young, measure the performance of data preparation operators. These statistics are keystrokes per hour and time on the system.

Keystrokes per hour records how fast an operator keys, and time on the system records how many hours during a week an operator is actually keying.

"We had been stressing keystrokes with a departmental goal of 12,000 keystrokes per hour", Young said. "We had come close to this goal several times, but never quite reached it. More recently, we began to realize the potential for improving departmental performance by increasing our time on the system. This had been averaging about 70%, or slightly over 26 hours of a 37.5-hour work week.

"We weren't sure what our goal should be, but in discussing the situation with Phil Funk, director of computer services, and Jeff Langmead, vice-president of corporate systems, we decided to set 80% time on the system as our goal.

"To help the operators in achieving this goal, we took another look at all of our applications and made some changes, such as eliminating some of the nonkeying functions performed by the operators and revising the sizes of the batches of work.

Most importantly, an incentive system was started to recognize operators who achieved the department's goals.

The incentive was called the "80% Club."

The club was to be formed of operators who keyed at a production rate which was determined by multiplying an operator's time on the system by the keystroke rate. An operator had to achieve a monthly average production rate of 8,800 keystroke/hour by a time on the system of 80%. A senior operator had to maintain a production rate of 10,400 keystroke/hour, which was set by a keying rate of 13,000 keystroke/hour and 80% time on the system.

Awards for club membership included attending the monthly club meeting at a local restaurant. Three months continued membership meant a $50 cash award; an additional three-months continued membership meant an additional cash award of $75.

The results of the 80% Club have been outstanding, Funk said. Since May of 1975, average operator productivity has improved by 30%. The department is doing 10% more work than a year ago, with three fewer operators.

During May of this year, the department averaged 82.3% time on the system, with an average keying rate of 12,571 keystroke/hour.

This reduction in processing time was reflected in the total time required to process claims. Additional quality checks have shown that proper quality is being maintained with the increased production.

Optical Mark Readers Help States Meet Report Regulations

BOISE, Idaho A Maryland vocational education research group is using optical mark readers both to help state agencies meet government report regulations more efficiently and to provide students with practical data processing experiences.

Ten Hewlett-Packard, Co. (HP) 7260As are associated with HP Model 2640 CRT terminals and HP Model 9866A thermal printers in remote station configurations located in school districts throughout the state.

The heart of the remote job entry (RJE) network is an HP Model 3000CX computer, installed in the Anne Arundel County Public School District near Baltimore.

The system was purchased as part of a research project entitled Administrative Information Management System (Aims), according to Gary Q. Green, director of the Maryland Research Coordinating Unit for Vocational-Technical Education (MRCU).

The purpose of the project is to test alternate ways to help agencies comply with the large amount of information required by the federal and state governments, while allowing hands-on experience for students.

Under supervision of state vocational education agencies, every school district in the U.S. must complete massive federal reports.

In attempts to reduce the cost and time expended, a few states have tried batch processing, but in most cases these efforts have been unsuccessful because of slow turnaround times. The MRCU decided upon a research project to find out if optical forms could provide the ease and versatility necessary for an on-line system.

The Aims system also processes data on vocational education students received directly from the remote stations. The key operating element in this operation is the HP Model 7260A optical mark reader.

The program is based primarily on the use of easy-to-complete optical forms. Now, 123 characters per student can be collected for a cost of 2.2 cents.

The HP 3000CX computer edits the information and compiles it into a final printout in a format acceptable to the Federal government. Using the Model 3000CX system significantly reduces forms handling and processing costs, Green said.

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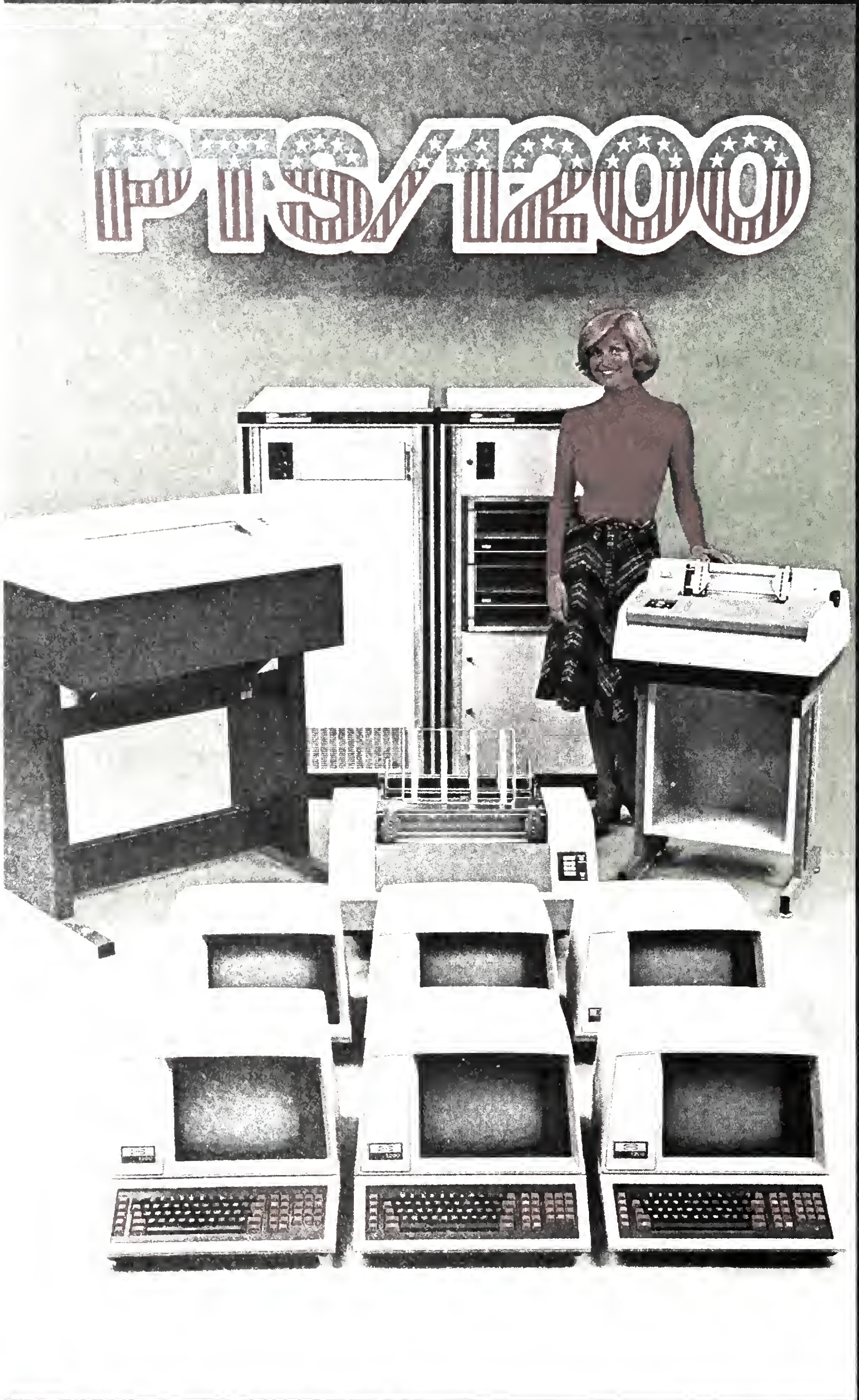

Raytheon's new PTS/1200 distributed processing system gives companies with extensive branch operations new independence from centralized information handling.

The versatile, cost-effective PTS/1200 system allows remote sites to perform their own:

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- fast, flexible report printing, in many formats;
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Ready-to-use software gets your data up fast — and you can program your own applications easily. The system can utilize up to 24 terminals simultaneously. It reduces computer line costs and forms costs, expedites data retrieval and reports, improves productivity and requires minimal operator training.

A demonstration says it all.
To arrange that, write to Raytheon Data Systems, Marketing Department, 1415 Boston-Providence Turnpike, Norwood, MA 02062 — or telephone 800-225-9874 (toll-free). When you build better information processing systems . . . **the Word gets around.**

INTELLIGENT TERMINALS, MINICOMPUTERS AND TELECOMMUNICATIONS SYSTEMS

RAYTHEON DATA SYSTEMS RAYTHEON

While Increasing Data Accuracy

Ordering Units Allow Salesmen Time for Selling

Hardware wholesalers utilizing electronic ordering systems for the collection and inputting of salesman order information have gained a substantial amount of time – time that is being used to improve many aspects of their operations.

Utilization of accurate computerized ordering data made possible with an MSI Electronic ordering system allows wholesale hardware distributors to increase sales volume, reduce data processing costs, reduce standing inventories while optimizing merchandise mixes, improve wholesale and delivery scheduling and offer substantial customer service advantages which help the retailer increase his number of merchandise turns, according to the users.

Salesmen use data entry terminals rather than paper, clipboard and pencils to record merchandise code numbers.

The five wholesale hardware distributors are Orgill Brothers in Memphis, Tenn.; Townley Hardware in Kansas City; Geo. A. Clark & Sons in Minneapolis; Pacific Marine Schwabacher in Seattle; and Stratton-Warren in Memphis.

Salesmen for these distributors use MSI Portable Data Entry Terminals to record their daily order information instead of hand writing the orders on forms and have eliminated either mailing orders to the warehouse or telephoning the information to an order taker.

Salesman use the MSI terminals to transmit their orders via ordinary telephone lines in less than three minutes, the users said.

Reduces Time, Labor

Using the MSI system reportedly reduces the amount of time and labor that was formerly spent preparing and inputing order information.

"Salesmen are gaining more time to do their selling job because they are no longer hampered with time-consuming ordering procedures. Employing the MSI system enables each salesman to spend more time with existing accounts or to prospect new ones," David Townley, DP manager at Townley Hardware, said.

Prior to streamlining operations with the MSI Electronic Ordering System, order information reached the warehouse operations in unpredictable patterns. Lengthy, uncertain telephone conversations between order takers and salesmen often were misinterpreted and wrong merchandise or quantities were shipped.

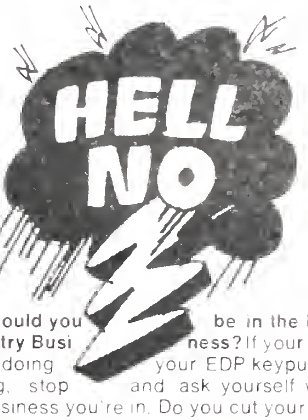
Delays in orders mailed to the warehouse were frequent and appropriate warehouse shipping scheduling was impossible. Errors in order filling were common, but the ability to track the errors down was tedious and time-consuming because any number of order-preparation and processing steps had to be checked.

"Sporadic preprocessing and processing poured work onto warehouses in uneven doses, which caused unnecessary overtime expenses or left warehouse personnel idle for stretches of time," Byrne Whitehead, controller at Stratton-Warren, said.

Timely, accurate input of order information that can be scheduled on a daily basis means reduced turnaround time for the retailer. Many of these distributors report reductions in turnaround time by as many as seven days because the mail and preprocessing steps have been eliminated.

The result is better service and more accurate inventory control for the retailer, according to MSI. Because he is getting merchandise on his shelves sooner, he is reducing his out-of-stock condition and his ordered merchandise reflects what his actual shelf-inventory situation is, rather than stock ordered on estimation of sales.

By connecting a telephone receiver to the portable data terminal's communication unit, recorded order data can be sent in a computer-compatible form to a receiver at the warehouse processing center.



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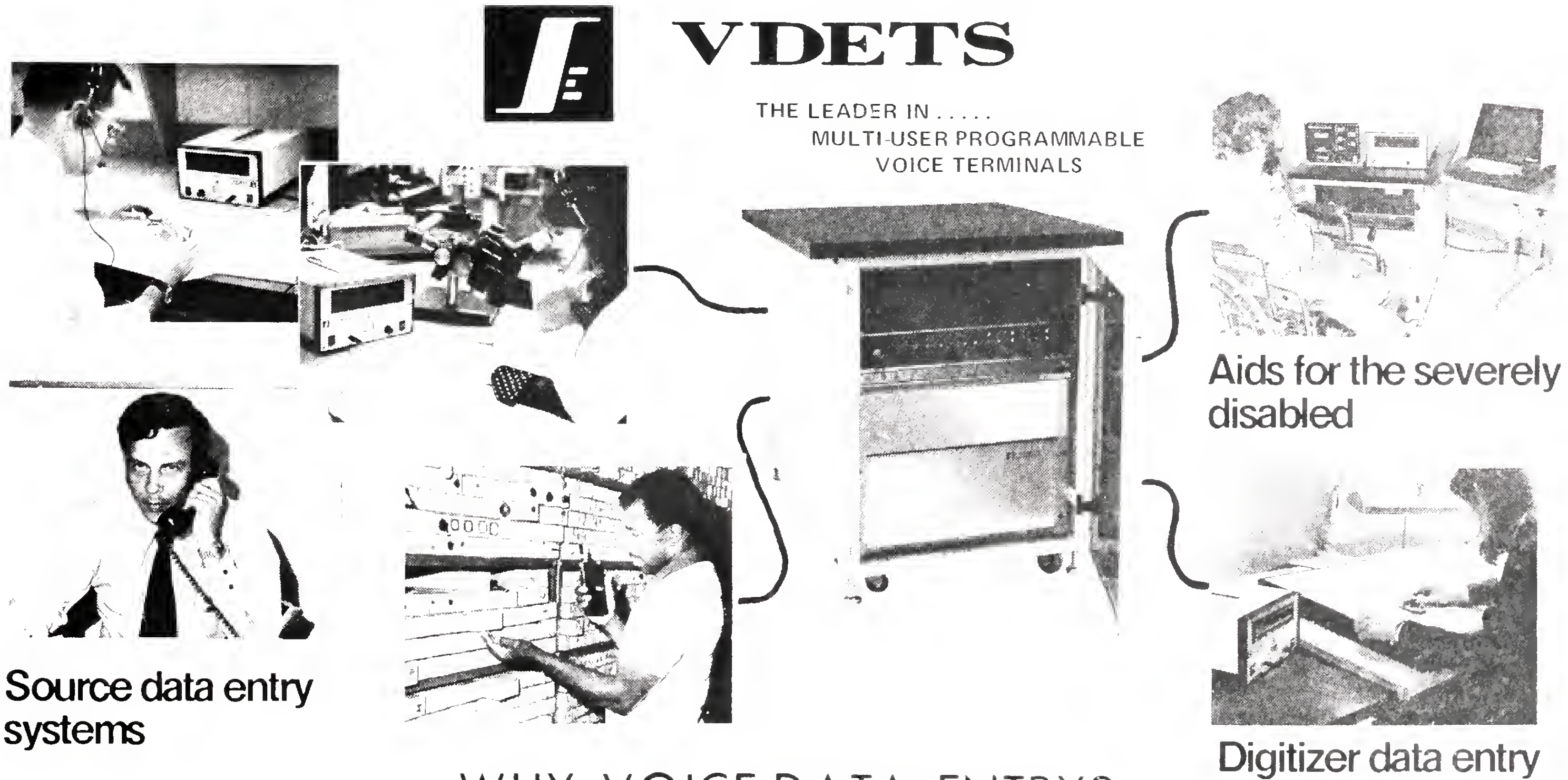

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Hospital Finds Key-to-Disk Cure for Work Pileups

MILWAUKEE – Two key-to-disk systems have proven to be the solution to a hospital's data entry workload problems and the key to a future information retrieval system.

St. Luke's Hospital has increased its data entry productivity 25% since installing an Inforex 1302 key-to-disk system and has been able to handle increased data entry workloads without a proportional increase in its staff, according to Ronald Hartig, operations supervisor at St. Luke's.

The 540-bed general-care hospital runs its data entry department three shifts a day, seven days a week, with the heaviest usage occuring on the 4 p.m.-to-midnight shift, when all five keystations on the 1302 are in use.

Nearly all the hospital and patient information processed by the hospital's IBM 360/40 computer is prepared on the Inforex 1302, Hartig said, adding that one IBM Model 129 keypunch has been retained for some low-volume card applications.

"We broke even on cost, even though we kept one keypunch," Hartig said, "but we've gained in productivity, reduced noise and have high-reliability equipment with excellent service."

"We have a very reliable system, in which the downtime is very minimal. We like it very much, and I don't see how anybody could have a card shop or other data entry system."

St. Luke's Hospital first made the switch from keypunch cards to key-to-disk in the spring of 1973, installing the 1302 with four keystations – a move which canceled the hospital's need to hire two additional operators at that time, he said.

Since then, the hospital installed an additional keystation and hired one more operator, but the increase in St. Luke's data entry workload has exceeded the increase in data entry costs, he said.

"We are now keying in excess of 3,000 more records a week than we were before we added that fifth keystation," Hartig said. "Our total workload involves about 99,000 records per week."

Data entry applications now on the system involve admissions, patient charges for medicines and ancillary items, inventory functions, accounts payable, asset accounting, budget and general ledger reporting systems, patient discharges, patient room transfers and a building-fund contributors' reporting system.

St. Luke's Hospital also uses its key-to-disk system and computer in a checkless payroll application involving most of the hospital's 2,600 employees.

During each two-week pay period, the hospital prepares a computer tape with employee payroll information and gives that tape to a large Milwaukee bank. Net pay is deposited electronically in the account of each employee.

An operator at St. Luke's Hospital uses the key-to-disk data entry system.

Additional Productivity Gain

St. Luke's Hospital recently decided to upgrade its 1302 configuration to a five-keystation, Inforex 1303 system. The greater power and flexibility of the 1303 will allow the hospital to increase its data entry throughput even more, Hartig said.

For example, keystation operators currently enter data taken from patient admissions forms, he explained. Under the former keypunch system, that data required nine separate punch cards and nine individual "passes" through the form before all necessary data could be entered.

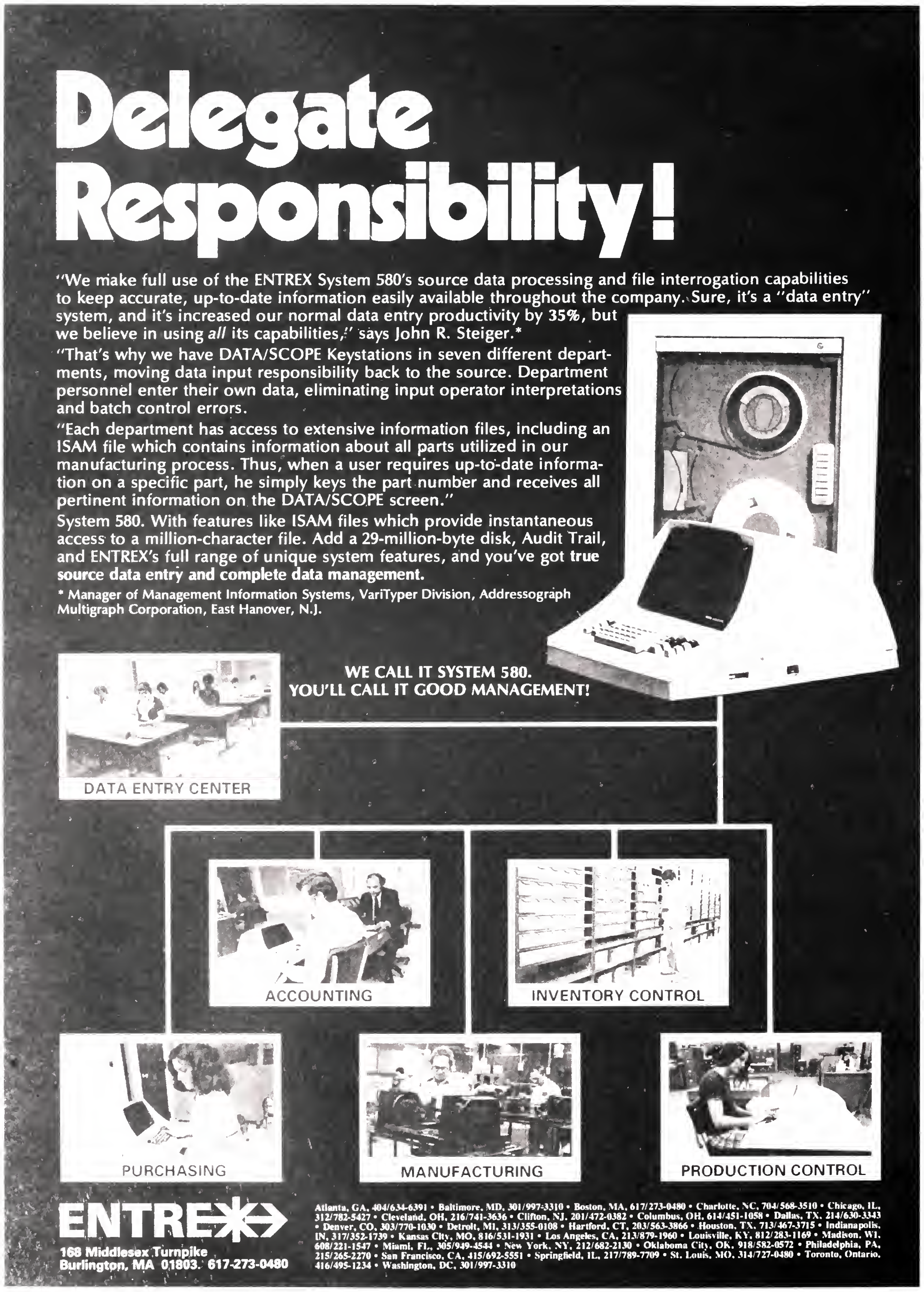
The 1302 can capture the same amount of data with only two passes through the form, Hartig said. The 1303, which allows a greater number of levels of programming, will allow keystation operators to capture all the data on an admissions form with a single pass through that form.

Currently St. Luke's Hospital maintains some 350,000 3 by 5 cards, each containing a record for every patient that had ever been admitted to the hospital.

"We have been maintaining those cards in a manual file, and the file is getting so large we would have to expand it. Since that's an outdated way to keep records, we plan to convert the information from those cards into computer format."

Initially the 1303 will be used for that conversion, Hartig said. When the conversion is complete, the 1303 will replace the existing 1302 equipment.

Currently, the card file must be searched manually each time an authorized member of the hospital's staff phones in a request for information. In the future computer terminals will be placed in the appropriate area of the hospital for data retrieval.



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* Manager of Management Information Systems, VariTyper Division, Addressograph Multigraph Corporation, East Hanover, N.J.

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Bits & Pieces

Saving Energy at DP Sites Theme of Five Symposia

CHERRY HILL, N.J. – A series of symposia on energy conservation is being offered in Boston, Chicago, Philadelphia, Jacksonville (Fla.) and Miami by AC Manufacturing Co.

The two-hour sessions on energy reduction in computer rooms include discussions on how to use less energy, lower electrical demand in computer rooms, reclaim computer heat and maintain reliability.

Further information is available from James Massett, AC Manufacturing Co., Old Cuthbert and Deer Roads, Cherry Hill, N.J. 08034.

Wright Line Keypunches Portable

WORCESTER, Mass. – Wright Line has two portable keypunches for plastic or paper cards.

The model 2610-00 encodes standard 20-column Type 2 and Type 51 credit cards with up to 240 punch positions; the Model 2620-00 encodes 3-1/4-in. high cards.

Wright Line 160 Gold Star Blvd., Worcester, Mass. 01606.

NMA Prints Government Standards

WASHINGTON, D.C. – The National Micrographics Association (NMA) has released a publication for micrographic service bureaus and manufacturers doing business with the U.S. government.

Entitled *Basic U.S. Government Micrographic Standards and Specifications*, the book contains reprints of the standards established by the government up to April 1976.

The publication, designated RS1-1976, is priced at $15 for NMA members and $20 for others from NMA Publication Sales at 8728 Colesville Road, Silver Spring, Md. 20910.

Ibfi Slates Conference on Forms

NORDIC HILLS, Ill. – The International Association of Business Forms Manufacturers (Ibfi) has scheduled a conference here July 28-30 covering the technical areas of common interest to forms manufacturers and those who design, plan, manufacture and support forms.

Formstech '76 will include sessions on the practical aspects of forms runability, the impact of standards and factors in forms design and feeding mechanisms which determine "like-cycle costs" of printout and reading systems.

Further information on the conference, which will be held at the Carson Inn here, is available from Ibfi at 1730 North Lynn St., Arlington, Va. 22209.

Centers Already Exist

Public DP Access More Than a Concept

By Catherine Arnst
Of the CW Staff

NEW YORK – Public access to computers is not just a concept being discussed at computer conferences there are centers providing that service already in existence around the country.

A public computer center to be used primarily by school-children in Washington, D.C., is being planned by the Center for Inquiry and Discovery (CID) there. Part of that planning process consists of an ongoing survey of existing public-access computer facilities throughout the country.

Included in the survey are several research-oriented labs whose goal is the development of computer systems that can be used by the public. Twelve such centers have already been visited by the institute's staff.

One of these was the Lawrence Hall of Science at the University of California at Berkeley, a science museum staffed by students that has five terminals in the exhibit area linked to three computers.

The philosophy of the museum is to provide "a nonthreatening introduction to computers," Carol Kastner and William Underhill of CID said.

In Portland, Ore., the CID team visited the Oregon Museum of Science and Industry, which maintains a community research center providing access to scientific equipment that might be otherwise unavailable.

There, a Digital Equipment Corp. PDP-11/45 is used by about 40 high school students annually to do individual projects for which they earn credits.

A public access center not located in a museum is in a Menlo Park, Calif. storefront. The Community Computer Center offers computers for recreational uses; its activities include a hardware club, classes for teachers, birthday parties, field trips and game nights.

The Pacific Science Center in Seattle is located in the U.S. exhibit building of the 1962 World's Fair. The center has two terminals running games with time donated by local schools and businesses and is planing to expand its computer activities.

In Boston, CID visited the Children's Museum and the Museum of Science, both of which have exhibits featuring computers that can be used by visitors.

Some of the research centers visited so far by the CID team include MIT's Logo project, the Soloworks project at the University of Pittsburgh and Xerox's Parc group.

Logo has developed methods to help young children learn mathematics and logical thinking using the Logo language, computer-controlled devices and graphics.

Soloworks is developing the hardware, software and courseware for an open mathematics laboratory. It uses a wide variety of peripherals that include graphic displays, robots and a pipe organ.

Parc has developed a computer system and language called Smalltalk which is meant to make graphics and animation easy to use.

Versatec Claims Plotter System Cuts 360/370 Users' Overhead

SANTA CLARA, Calif. – A plotting system for IBM 360/370 users uses vector mode operation for high speed on-line electrostatic plotting with reduced IBM 360/370 overhead, according to its vendor, Versatec.

The system includes an on-line controller, Versaplot/Pen Plotter Emulation Package (PPEP) software and one or more electrostatic plotters or printer/plotters.

The system controller emulates the IBM 3211 or 1403 line printers and provides compatible printer control and logic checking as well as buffers for print/plot lines, universal character sets and forms control, a spokesman said.

Channel address is via IBM byte multiplexer, block multiplexer or selector channel, he added.

The Versaplot/PPEP software reportedly provides a set of Fortran-callable subroutines compatible with existing incremental plotter routines.

Vector graphic information is accepted and converted to raster scan plotter output output by the system controller. The vector mode of operation substantially reduces host CPU time, core memory requirements and I/O channel time, the firm said.

Data is accepted on channel interface in burst, forced burst or byte multiplex mode. Using a double buffer of 2- by 1K bytes, the controller accepts a maximum burst rate of 500K byte/sec.

Three controller models are available to support one, two or four electrostatic units. Multiaddress configurations use only one position on the IBM bus, and control procedures and buffers are replicated for each attached unit, Versatec said.

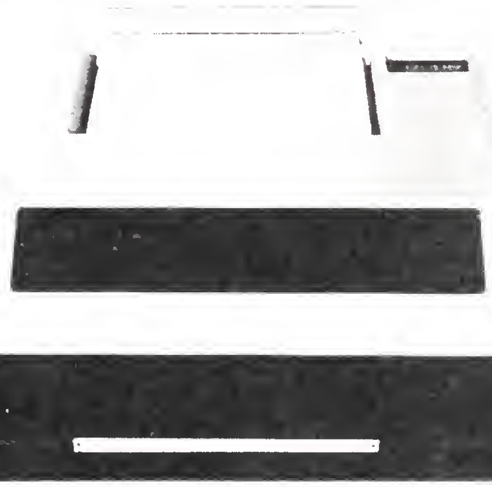
The price for the controller is $13,500, while the cost of the software can run from $2,200 to $3,500 depending on the package, Versatec said.

Costs for the plotter range from $13,500 for the 22-in. wide model to $49,500 for a 72-in. wide one. Versatec is at 2805 Bowers Ave., Santa Clara, Calif. 95051.

The Bucks Stop Here

NEW YORK – Computer technology is helping American Express keep track of millions of travelers checks as they are purchased and cashed throughout the world. The final tally is now being taken by two newly installed IBM 3890 document processors here handling more than one million items per day.

The 3890s read the magnetic ink check number under the control of a pair of IBM 370/125s; the information is sent to a larger system for processing and recordkeeping. The checks themselves are endorsed and sorted at a maximum speed of 2,400 per minute.



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Combined With Typesetting Technology

Tapes Play Double Role for Cost-Conscious State Office

SACRAMENTO, Calif. Keeping down the cost of government is the battle cry of many political figures these days, but in California the Office of State Printing (OSP) has been practicing such preaching for years with the aid of computer tapes and composition and typesetting technology.

Its most recent application entails having the state's payroll computer tapes perform double duty. In the process, production time for the wages and salaries section of the governor's annual budget has been slashed by more than 80%, an OSP spokesman said.

A similar application is reducing production time for the capital spending volume of the budget by 60%, he added.

Vincent Toolan, California's state printer, estimated an overall saving of $65,000 has been achieved.

Tapes End Up as Tome

Throughout the year, the computer tapes are used for customary payroll functions, such as issuing salary checks. Once a year, however, they are updated to project needs for the coming fiscal year and shipped to OSP for use in producing the budget.

The tapes are run through automated composition and typesetting equipment that transforms the data into pages of text which are then photographed to produce printing plates.

The wages and salaries volume runs more than 700 pages and is 1-1/4 in. thick. That tome has been published with this technique three years now.

This past January the same process was used for the first time to produce the other half of the budget, the capital spending volume that is 2-1/2 in. thick.

In the past, the budget was produced using traditional printing methods. Typesetters cast lines of type in hot metal, with months of copy preparation, typesetting, proofreading, editing, laying out and printing involved. Toolan estimated three to four months of several people's time were required.

For several years, the office has been using a Videocomp 800 manufactured by Information International, Inc. of Culver City, to publish a wide range of state reports and documents.

Since fiscal 1974, the wages and salaries volume of the budget has been produced by this equipment. Operators in the State Controller's Office and other state agencies handling payroll functions were instructed by OSP technicians in preparing their payroll tapes to serve the dual purpose.

Instructions 'Buried'

Information governing the composition and setting of the data—such as type style, size and column width as well as format of columns and pages— is added to the tapes.

In effect, this material is "buried" on the tapes and does not effect their ongoing use for salary administration, Toolan said. But, when the tapes are inserted into the Videocomp 800, these instructions guide how the data is set up as text.

Operators in the State Controller's Office alter their tapes once a year to incorporate salary projections for the coming fiscal year, and the tapes are then sent to OSP for use in producing the budget.

"It's simply a matter of taking an existing computer file and massaging it to produce the printed document," Toolan said. "The three major elements are the State Controller's Office, which issues checks for state employees, the University of California and the Trustees of the State Colleges and Universities.

"These organizations use standard DP techniques to update their computer files," he noted.

"The files usually are complete when they send them to us, but we have the ability to go in and make changes easily," he added.

However, Toolan noted, information for the capital spending volume is not always standardized and new tapes often have to be keypunched to update information. That's why the time savings for that book isn't as great as with the wages and salaries volume, he explained.

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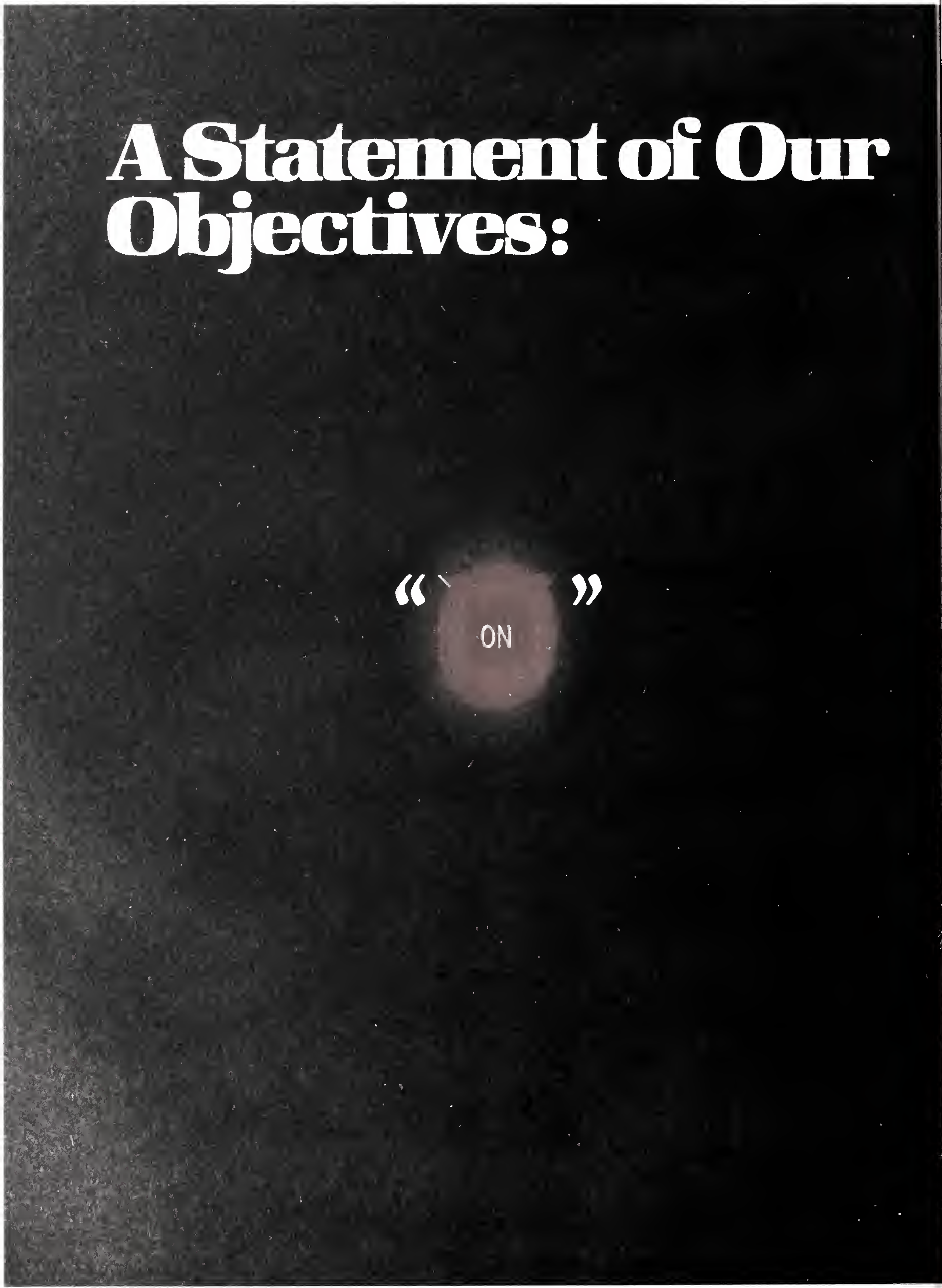
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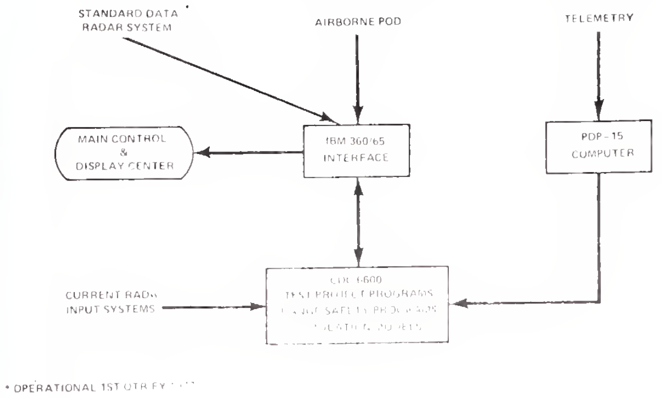

Consolidated Elgin Real-Time System

ELGIN AIR FORCE BASE, Fla. The U.S. Air Force (USAF) Armament Development and Test Center (ADTC) located here has as its mission the safe testing of newly developed conventional munitions. Increasing emphasis on safety and cost-effectiveness of test missions has led to the development of a computer-based Consolidated Elgin Real-Time System (Certs).

The system involves real-time data collection, processing, display and result transmission while the aircraft and/or missile is flying its mission.

To accomplish this task, the Computer Sciences Laboratory at ADTC has designed and developed in-house a computer complex that includes an IBM 360/65, a Control Data Corp. 6600, a Digital Equipment Corp. PDP-15 and several PDP-11s.

Computer output is provided on CRTs for observation by test personnel, and the information to be displayed may be selected by means of alphanumeric keyboards. A communications network was fabricated to permit vocal control of mission status and to permit test personnel to talk to aircraft crew members and/or test controllers.

Input data sources to the Certs system consist of several radars for aircraft or object tracking and telemetry data from airborne sensors or ground receivers.

The data is centralized in the IBM 360/65, logged on magnetic tape and then dispatched to a real-time applications program on the IBM or CDC 6600 machine. The PDP-15 is the telemetry data front-end processor for the system, and it converts any type of signal into engineering units and then transmits the data to the CDC 6600, an ADTC spokesman said. The display processing is handled by the IBM 360, which is connected through a locally designed fabricated interface to the CDC 6600.

A backup to the large computer system is provided for present-position situation displays and some limited alphanumeric data on a DEC PDP-11/40. The PDP-11/40 is interfaced to four Tektronix, Inc. 4014 storage tube CRTs with hard-copy capability.

Certs Software

The system software to support the Certs complex is partly vendor-supplied but heavily modified or supplemented by locally written routines. The CDC 6600 operates in the Scope 3.4.3 operating system with some very minor modifications to the job scheduling routines, the spokesman said.

Several real-time peripheral processor unit (PPU) routines were written to support up to four simultaneous real-time jobs on the CDC 6600, which may in turn communicate with a job on the PDP-15 or up to four jobs on the IBM 360.

The 360 operating system is O/S-MVT Release 21.8, with a heavily user-modified, vendor-supplied, real-time monitor (RTM) program. A submonitor was written locally to provide for 360 real-time job scheduling, data transmission and recording and all display processing and input/output operations.

The applications software on the Certs system is written entirely in Fortran and may be run on either the IBM or CDC computer, the spoksman said. The applications are mission-oriented and may have either a data reduction or range safety application or both.

The aim of the Certs design philosophy is to develop relatively small, modular programs which may be readily adapted to changing mission requirements or discarded if written for a one-time support requirement, the spokesman added.

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System Helps Keep Cash Flowing for Water Department

HOUSTON – This city has turned to a computer system to get a better handle on its monthly water bills.

And the same computer also processes all city taxes, tracks library books, matches car poolers, prepares bills for the health department and soon will handle municipal court schedules and a revitalized financial management system.

As a result of the combined efforts of the city's Water Division and the Management and Information Systems (MIS) department, Houston will collect $1 million more this year than would have been collected under the previous system, according to R. Bradford Thomas, director of Houston's MIS Department.

"Houston now receives an unprecedented 99.5% of all water funds owed the city, while saving the taxpayers' money and providing better customer service," he said.

Posting Time Halved

"We process approximately 20,000 transactions a day, valued at $200,000, through our Honeywell dual 6060 computer," he continued. "Within 24 hours – half the time it used to take – water payments are posted to customer accounts and relayed to the banks for credit into city accounts."

Fast turnaround of cash nets the city $2,000 in monthly savings, Thomas said.

"This seemingly insignificant amount from 600,000 payments has great impact when you realize it comes from a lower interest rate that is the result of an improved city credit rating," he said.

"To process revenues received by mail and from customers who pay in person, as well as to handle customer inquiries and signal start/stop of service, we installed a network of 47 additional on-line terminals throughout the Water Division. This expanded the total division network to 77 devices," Thomas said.

"Nine of the additional video display terminals, which help determine customer-requested up-to-the-minute account status, increased Water Division productivity more than 2,000 worker-hours per month," he said. "Of course, this also has increased customer satisfaction."

Not Always as Efficient

It wasn't always as timely or as efficient, Thomas said. Just before he joined Houston as director of the MIS Department, Mayor Fred Hofheinz and the Houston City Council changed Water Division meter reading and billing cycles from every two months to every month. And later, in what the mayor termed "a hard, unpopular, but necessary decision, the drain on the city's general fund was removed by putting our water system – Houston's largest utility – on a self-sustaining basis."

These actions made everyone realize that operating procedures developed in 1964 weren't applicable in 1974, Thomas said.

"By January 1975, after a major Water Division reorganization, we installed the additional video display terminals and revised the Water Division's computer usage. Computer programs and procedures were improved and updated as rapidly as possible," Thomas said.

Other savings-oriented measures taken at the same time involved replacement of more than 50,000 old meters with easier-to-read, more accurate devices and the creation of a meter-reading school. "Both moves have increased meter reading accuracy to 99%, a considerable improvement," Hofheinz added.

Looking at Other Areas

"Today, besides plans to include more on-line management control for the division, we are looking at other areas of the Water Division for ways the computer can assist in increasing overall effective performance," he added.

Similar activities are being initiated throughout the city of Houston. Various departments, working with management and information systems, have a key role in the efforts of Hofheinz to implement procedures that prove government can benefit from sound management techniques applied to municipal problems.

"Houston's city government – with a budget of $333 million and 14,000 employees – is a big business," he said. "In addition to improving Water Division operations, we modernized the city budget to make this highly visible facet of municipal management a planning tool for city officials as well as a meaningful source of public information.

Schedules Projects

"Houston also has reestablished a capital improvement program that reflects and schedules two-year construction projects," he continued. "Developing the program required department heads and officials to assess needs realistically, weigh resources and determine priorities."

Similar attitudes and techniques have made the MIS department a workable utility for the city as well, Thomas said. "The department was created to coordinate information and data processing among city departments, a move in itself that has realized substantial savings of tax dollars," he said.

Moving Facility

The MIS department is moving to a new, expanded facility. The 37,000-sq-ft area of the Municipal Courts Building designated for MIS personnel and related equipment was designed to contain Houston's full-scale computer operation.

Included in the move will be the Honeywell dual 6060 large-scale computer system with 512K words of main memory, three printers – two attached with OCR-A to print control numbers on water bills, two Datanet 355 front-end network processors to provide communication links with more than 140 remote terminals, eight Honeywell tape drives and 16 190B disk drives with a capacity of 1.9 billion characters.

Also to be moved will be all the necessary peripheral equipment, such as the Lundy-Farrington optical scanner, used to process the paid water bills.

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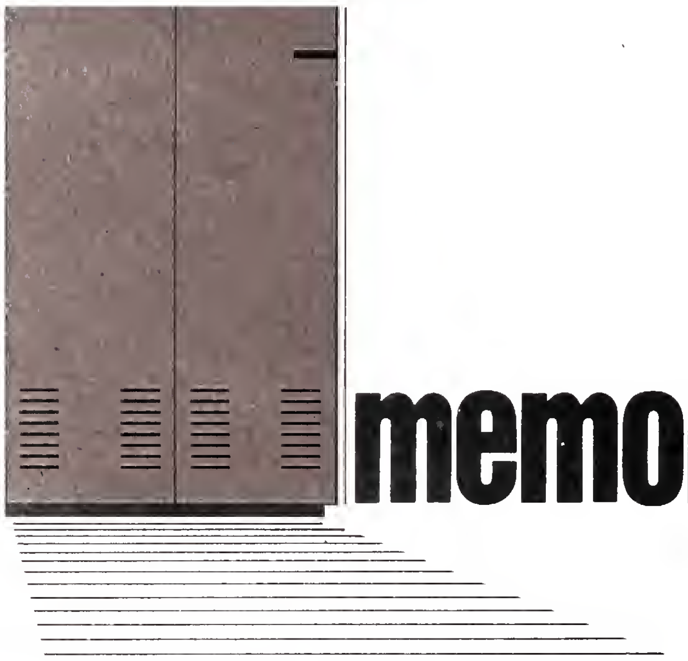

Interdata Extends 16-Bit Line at Top and Bottom

By Esther Surden

Of the CW Staff

NEWTON, Mass. -- Interdata, Inc. has introduced two minicomputers models which round out the firm's offerings at the top and bottom of its 16-bit product line.

The low-end Model 5/16 was primarily designed for incorporation into OEM systems and for use by systems builders. It is comparable to the Digital Equipment Corp. LSI-11, a spokesman said in an interview here.

The Model 8/16 can be compared to the DEC PDP-11/34 and was designed for both OEM and end-user applications, he said.

The 5/16 with 8K bytes of NMOS memory costs $868 in 100-unit quantities, Interdata said. A comparable 8K-byte LSI-11 costs $634 in the same quantity, a DEC spokesman said.

The basic 8/16 with 32K bytes of memory costs $4,160 in quantities of 10. The 32K-byte PDP-11/34 costs $9,290 in single-unit quantities, DEC said.

The 5/16 is contained on a single printed circuit board and includes an Interdata 16-bit processor with 16 general-purpose registers and 114 instructions.

Up to 64K bytes of 600 nsec random-access memory can be accommodated on the board. The processor also features direct memory addressing up to 64K bytes, the Interdata spokesman said.

The 5/16 is both software- and peripheral-compatible with other members of the Interdata 16-bit family line, he said.

The 5/16's bus structure includes both the standard Interdata multiplexer bus found on the other members of the line and a Micro Bus, introduced at the National Computer Conference recently.

The Micro Bus is compatible with the I/O buses of the Intel 8080 and Motorola 6800 microcomputers, allowing the CPU to be interfaced to micro-controlled devices, the firm said.

The top-of-the-line 8/16 adds single- and double-precision floating-point hardware to an Interdata 16-bit CPU for the first time, the spokesman said. Previously these functions were performed by firmware, he noted.

Typical double-precision floating-point times are 5.7 μsec for an add and 17 μsec for a divide, he said.

The 8/16 features 16 general-purpose registers and direct memory addressing; it supports up to 64K bytes of 750 nsec core memory.

The 8/16's core memory features a 275 nsec access time, a speed faster than that previously available on the firm's 16-bit systems, the spokesman said.

Both the 8/16 and the 5/16 run under the firm's OS/16 MT multitasking operating system.

The 5/16 processor, 8K memory enclosed in a five-slot chassis with a 25A power supply and current loop interface costs $1,395, the firm said.

The 8/16 in a 16-slot chassis with a 50A power supply, hexidecimal display panel, 60 Hz clock, power fail/auto restart, operating system bootstrap loader; single- and double-precision floating-point hardware, and disk and teletypewriter interfaces costs $16,761.

Interdata is at 2 Crescent Place, Oceanport, N.J. 07757.

Basis of Dispatch System

Minis Cut Emergency Response Time of Boston Police

BOSTON -- Shortened response time to emergencies was the goal of the Boston Police Department here and that goal has been met through a Computer-Aided Dispatch (CAD) system using minicomputers, according to Joseph Sarno, the department's DP director.

The CAD system, which replaced a manual complaint-taking and dispatch system, consists of two Data General (DG) Eclipse S/200 computers with 88K bytes of core memory.

Each system has two 25M-byte disk units, an 800 bit/in. magnetic tape drive, paper tape reader, 165 char./sec and 300 line/min printers and dual access asynchronous line multiplexers to interface the system's 37 CRT terminals. One system is on-line, while the other runs in a "watchdog," backup mode.

A request for proposals based on visits to other cities with computerized dispatch systems drew a response from Arthur D. Little Systems in Burlington, Mass., which recommended DG as the hardware vendor. Cost for the system was about $360,000; software costs totaled about $260,000, Sarno said.

In the 911 Operations Center, 14 complaint clerks handle some 3,500 telephone calls a day from citizens who dial 911 to report emergencies.

Each clerk's CAD workstation consists of an interactive CRT terminal on-line to the minicomputer. As calls come in, they are automatically switched to the first available clerk, who asks any pertinent information.

With the manual system, the clerks wrote this information on a punch-type card, then checked a lengthy computer printout of all Boston streets to determine if the incident's location was a valid address and found the corresponding police district and car sector.

After verifying the address, the clerk placed the card in a conveyorized trough

(Continued on Page 36)

Cincinnati Milacron Adds Series for DP, Offices

LEBANON, Ohio -- Three series of small systems designed for single and multiple users in accounting, distribution and manufacturing applications have been introduced by the Cincinnati Milacron Co.

The 60 and 70 series systems are based on the firm's CIP/2200B CPU while the System 81 is based on a CIP/4400 CPU introduced with the systems, a spokesman said.

The systems range from small batch configurations with 5M characters of auxiliary storage to multiprogramming systems with 40M characters of disk storage, additional tape and multiple data entry/inquiry CRT terminals.

All systems include the Cincinnati-Milacron Operating System (Cimos) with RPG-II, it noted.

The top-of-the line System 81 for multiuser DP applications includes a 960-character CRT console, an interface for up to eight additional CRTs and a 60-in. cabinet containing a 10M-byte fixed/removable front-loading disk drive and pack.

The System 81 CPU is the CIP/4400, which features a memory management unit, disk initial program load, memory write protection, 50-hour battery backup, memory parity, real-time clock, stack facility and hardware multiply/divide.

The unit accommodates 9-bit MOS memory and up to 96K can be housed in the system chassis. Cycle time is 800 nsec for 1 byte, according to the firm.

The Series 70 includes the System 70 and System 71. The System 70 was designed for single-user DP applications while the 71 is intended for multiple users.

Both systems include a CRT with front-loading disk drive, CIP/2200B CPU with front panel, direct memory access channel, MOS memory, five I/O ports for options, a printer controller with cable and a disk controller.

The System 70 is available with optional printers, ranging in speed from 60- to 600 line/min and additional disk storage. Up to four magnetic tape units can be attached to the system.

In addition, the System 71 can have a maximum of eight 1,920- or 960-character CRTs.

The single-user System 60, housed in a 30-in. cabinet for office applications, is also based on the CIP/2200B CPU and can accommodate three additional tape drives and one CRT. The multiuser System 61 can have up to eight CRTs and two printers, the firm said.

A basic System 60 with 32K bytes of memory and 5M bytes of disk costs $26,100; a 48K System 61 with 4M bytes of disk costs $30,300.

The System 70 with 32K bytes of memory and 5M bytes of disk costs $26,200; a 48K System 71 costs $30,400 with 5M bytes of disk.

The System 81 with 64K bytes of memory and 10M bytes of disk costs $42,800. The systems are available from the vendor's Process Control Division at Mason-Morrow Road, Lebanon, Ohio 45036.

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Although Multivendor System Cheaper

Mini Maker as Single Source Called Users' Best Bet

By Jon David

Special to Computerworld

On paper, a mixed-vendor system offers an end user the best of all worlds. He can select the exact equipment which best fits his present and anticipated requirements and get such equipment at the lowest possible price.

Minicomputer Exchange

In practive, replacing the paper with the reality of actual business environments, there is often considerable difficulty in getting such systems to work and almost always significant problems in getting such systems maintained.

The growth of the peripheral equipment industry has enabled it to catch up to, and in many places surpass, the growth rate of the minicomputer industry. Today, if you operationally compared all minicomputers, you would find that they are effectively the same in probably 80% of all areas, are slightly different in another 15% of the areas and offer significant differences in only the remaining 5%.

In the peripheral equipment area, differences are much more meaningful and obvious.

Most minicomputer manufacturers do not make any peripheral equipment. A few make certain peripheral devices such as a disk drive or tape transport.

To remain competitive and be able to satisfy most requirements, the manufacturers offer comprehensive product lines to prospective users. They do this by selecting outside sources for peripheral equipment and integrating that foreign equipment with both their hardware and software.

You are visited by a computer salesman. He offers you a small disk, a medium disk and a big disk. As far as you are concerned, he makes these products. Although, in truth, you are actually getting a mixed-vendor system, one company, the computer manufacturer, is taking total system responsibility in both the hardware and software areas.

If part of the system you are considering is a Brand X line printer, you might find that you can go to Brand X and buy the same printer for less than the price charged by the computer manufacturer.

In some cases minicomputer manufacturers will let you do just that, provided you buy the interface/controller from the manufacturer, and they will still maintain all hardware and software; most, however, will not let you do this.

What Can Happen

The big problem arises when you want equipment not in the manufacturer product line. He may have, tor example, disks that are either too small for your application or too expensive, printers that are either not powerful enough or too expensive or other equipment that just won't do your job.

You would like to use his computer and must, therefore, consider getting peripheral equipment from appropriate other sources. What can happen if you decide to put together the "best" system to satisfy your requirements?

You, being knowledgeable in such things, buy only peripherals that come with interfaces/controllers for your equipment and operating system software patches that will allow this equipment to be properly serviced by the manufacturer's software.

Let's say, for example, you buy a card reader, fully guaranteed to work. You get it, plug it in, turn it on and tell it to read cards. Wonder of wonders, it reads cards!

The Minicomputer Exchange is intended to be a means for users to present ideas about minicomputer problems and performance. Readers are invited to respond to this commentary or submit manuscripts about significant topics.

It reads cards so enthusiastically that it reads one more card than you told it to; you try it again and again and again and find that it still reads the one extra card each time.

Proven computer, proven card reader, proven interface – put them all together, they read one extra card. You don't think it can happen? It did to me.

Foreign disks, tapes, printers, video terminals, card equipment and other peripheral devices can always present problems when being interfaced to a computer. The problems need not be in hardware.

If, for example, you buy a bigger disk than a manufacturer supports, you may find that while the patches to his software may enable you to communicate with that disk, you can only communicate with the corresponding storage volume; what this means is you may have a 50M byte disk and only be able to access 10M bytes of it.

Getting System Maintained

Without trying in any way to minimize the problems involved in getting the foreign device to work properly, of far more importance to an end user is getting such a system maintained.

Your system, let us say, is down because you are getting continuous disk read errors. You call the disk company and it tests out its disk and interface/controller and shows you they are working perfectly; the computer manufacturer is then called, who similarly proves his equipment is perfect.

What then too frequently follows is a finger-pointing interchange. Obviously, you must get a single-source-maintenance vendor.

Independent maintenance contractors normally work on a time and materials basis. Since they do not have sufficient volume to justify the maintenance of adequate spare parts inventories, they frequently must get replacement parts from the manufacturer (normally at lowest priority), and since they often work on totally different equipment on different days of the month, it is hard to find them expert in your particular equipment set.

It is not uncommon, for example, to have an independent service vendor require an end user to furnish maintenance manuals so he might first learn the equipment before servicing it.

Is there anything you can do?

Independent systems companies often offer maintenance for systems they provide which are mixed-vendor systems and that are not serviced by the computer manufacturer. They either provide such service through an independent service company or actually maintain the equipment themselves.

If it is a custom systems house, it may provide different hardware with each system and cannot be properly qualified to maintain everything. If, on the other hand, it offers a product line attractive to you, at least you have narrowed down the product set with which it must deal.

Of course, if it goes out of business next year, you may have problems getting your system maintained; similarly, if it decides to utilize alternative products in the future, you may have some difficulty getting your present equipment maintained.

Most major minicomputer manufacturers offer extensive lines of peripheral equipment, even though they do not offer everything and offer almost nothing at the lowest possible price.

If you buy from such a manufacturer, you have a single and reliable source who will work with you to see that your entire system functions properly.

David is president of Minicomputer Industry National Interchange (Mini), a professional society treating minicomputers, microcomputers and associated technological techniques, and he is also president of Systems RDI.

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Member Computer Lessors Association

Dual Minis Cut Response Time For Policemen in Emergencies

(Continued from Page 35)

which carried it to the dispatch area. There six police dispatchers, each handling two or more districts, picked up the cards, checked a card tub file which showed the availability of cars in each city district and then radioed the cars to the site of the incident.

Under the CAD system, the complaint clerks display a form with blank field on the CRT screen, type in the applicable information and assign a priority code to emergencies.

When the incident's location is entered, the system searches the address data base to verify address validity and assigns an incident number. If the address is valid, it displays the corresponding police district and car sector.

If the address given is invalid, it states the reason, such as "streets do not intersect."

A completed complaint is transferred to the appropriate radio dispatcher's CRT screen. Each dispatch position has two CRTs; one is interactive, the other displays the status of all cruisers, replacing the card tub file.

The dispatcher checks the display, radios an available car and then types the car number into the system.

If a caller calls again, the complaint clerk can tell the caller when the car was dispatched, Sarno noted.

As soon as a car is dispatched, a time counter in the system begins working and signals an alarm if a car has not reported its arrival at the location of the complaint within a predetermined time.

Operations Monitored

Between the 911 telephone area and the police dispatch area, communication supervisors monitor the CAD workstations of the complaint clerks and the dispatchers.

All incident messages are stored on the system's disk and can be retrieved by many of the complaint data fields, including incident number, location, nature and car assignments for status checks.

Complaint data is transferred to tape and sent to an IBM 370 for analysis daily.

The 911 dispatch system is the first phase of the CAD project. Next is the addition of stolen car information, arrest files, firearms registrations and hazardous locations to the on-line data base.

CI Notes

Wyly Puts Datran on Block, Cites Need for More Cash

DALLAS – It's official - cash-hungry Wyly Corp. has declared its intentions to sell or seek a merger partner for its infant with the large cash appetite, Data Transmission Co. (Datran).

In addition, Wyly probably will revise its recapitalization program to require exchange of almost all of its 7.25% debentures and 4% capital notes into an undefined equity security rather than Wyly convertible debentures and common stock as announced last March.

Sam Wyly, chairman of Wyly Corp., said the market for Datran's digital transmission services is "growing rapidly.

"I have complete confidence that Datran will ultimately be a very successful business, but Wyly Corp. is unable to supply the additional capital needed to carry Datran to profitability," he added.

"We hope to find an American corporation with a desire to enter Datran's segment of the telecommunications market and an ability to invest," he said.

Wyly and Walter Haefner Holding AG of Zurich, Switzerland, have invested about $43 million and $47 million respectively in Datran. Any recapitalization plan will require participation by Haefner on terms that are under discussion, Wyly said.

CDC, NCR, CPI Charged In $36.7 Million Libel Suit

PHILADELPHIA – A $36.7 million suit filed here against Control Data Corp., NCR Corp. and Computer Peripherals, Inc. (CPI) charges the firms with libel and slander.

CPI, a joint venture of CDC, NCR and International Computers Ltd. (ICL), manufactures printers, card punches and tape drives.

The suit, filed by a Holland, Pa., computer parts supplier, John A. Bauer Inc., and by John A. Bauer Sr. and Jr., alleged the defendants, in the course of investigating whether CPI employees in the purchasing department were given "bribes, payoffs and kickbacks," began looking into the Bauer company last July.

According to the suit, the investigators told others the Bauer firm was "under intense investigation . . . for having paid kickbacks and bribes" and had made an improper payment of a least $110,000 to a CPI employee.

The suit also said the investigators suggested the Bauers were involved with prostitution, gambling and illegal drugs. The suit called all statements false.

CDC and NCR spokesmen reserved comment because corporate lawyers have not received copies of the complaint.

In Anticipation of Market

Disk Drive Vendors Adding Larger Units

By Molly Upton
Of the CW Staff

NEW YORK Two trends evident among disk drive makers at the recent National Computer Conference here were anticipation of demand for 200M-byte to 300M-byte drives and the exodus from the IBM plug-compatible market.

Ampex Corp. has opted to emphasize the OEM market, as evidenced by its line of OEM drives. California Computer Products, Inc (Calcomp) has declared it will not compete head on with IBM-compatible products above the 3330-11.

Memorex Corp.'s philosophy in disk as in other areas is to offer IBM compatibility plus additional features.

Essentially all three have chosen not to compete head-on with IBM in the disk drive business.

"'Big Brother' is a tough competitor," according to Clifford Leath, director of product marketing for Ampex Corp.

The firm has changed direction in its disk area from its start in end-user, IBM plug-compatible drives and now sells only to OEMs, he said.

Some of its OEM customers buy IBM-type drives, he said, but these are still OEM sales.

Winchester-Type Drives

In line with its OEM philosophy, Ampex does not offer any Winchester-type disk drives. However, if the mini manufacturers were to endorse the Winchester technology, Ampex would evaluate such a product, he said.

Diva Corp., whose drives range from 5M byte-1 spindle to 300M byte/spindle, also does not have a Winchester-type model. "We don't compete with IBM," Gary Beebower, director of marketing, said. But should the mini makers offer Winchester-type drives, Diva probably will also, he said.

Although several firms have recently unveiled 200M-byte to 300M-byte drives, the real demand in the marketplace is currently for the 80M-byte range, the exhibitors agreed.

Ray Crowder, product sales manager for Control Data Corp., said the 80M-byte is the most popular in terms of shipments, but the 300M-byte unit is the firm's fastest growing disk product.

However, he expects the firm's new 12M-byte and 24M-byte drives "will be real hot movers," he added.

"The 300M-byte unit uses the same interface and controller as the series that extends down to the 12M-byte unit," he said. The 12M-byte and 24M-byte units are Winchester-type technology while the storage module drive series are modified 3330-type and operate at 6,000 bit/in. and 3,600 rev/min which is faster than the Winchester, he said.

Diva's bread and butter sellers are its 50M-byte and 80M-byte drives, Beebower said. However, the orders are coming in for the 200M-byte and 300M-byte units as well, he said.

The larger units are transparent to the system, he said, so no input/output driver is required.

The independent disk makers products are all probably within $500 of each other, Beebower said. "It's a very cost-competitive area," he added.

Ampex's fastest growing item is its 80M-byte drive because the mini and large minis can readily utilize this size drive, Leath said.

The larger drives will be the most popular eventually, he said, but many users are not ready to utilize this capacity yet.

Ampex is also delivering substantial quantitities of its old 58M-byte 2314-generation drive, he said.

Memorex is seeing increasing demand for its 3300-11 type drive, according to Bob Booth, sales promotion manager. It's disks range from 5M-bytes to 200M-bytes, and business is increasingly OEM by intention, he said.

California Computer Products Corp. has shelved its plans for the development of a 400M-byte disk drive and has renounced its intentions of going after the IBM 3350 plug compatible market according to a spokesman.

The firm fully intends to stay in the end user and OEM disk markets, he observed, and has several new products on the drawing boards at the moment, but those above the IBM 3300-11 in capacity will not necessarily be plug compatible with IBM units, he observed.

Hopefully the new systems will be able to be used with other mainframes as well as IBM, he said.

Adapso Committee Endorses Role Of Private Sector in EFTS Area

DEARBORN, Mich. The potential expansion of the Federal Reserve Board into the Electronic Funds Transfer System (EFTS) process should be prevented, according to the Association of Data Processing Service Organizations (Adapso) Committee of EFTS.

In the minutes of its meeting here, the committee endorsed the role of the private sector in the development of EFTS and outlined three problem areas, one of which was expansion of the Automated Clearing House (ACH) system into switching network capability.

Committee Chairman William W. Fletcher said he intends to draft a position paper on behalf of Adapso regarding EFTS.

Other areas of concern to the committee are legal liability and security and privacy issues.

On the expansion of the ACH system, the committee said it concluded the ACH system should remain established to oversee the contractual relationships among member institutions and to continue present check-clearing functions.

However, the private sector of the computer services industry is "best poised to man the computer processing function as it relates to a switch network with remote terminal functions.

"Thus the private sector should consider facility management possibilities or become directly involved in establishing centers to take over the direct deposit and other computer functions of the ACH," according to the committee.

Both the switch and an ACH should be independent, the committee indicated.

"The Federal Reserve should be stopped from becoming first involved with ACH as a switch and then expanding into network switch and then into the inevitable data processing related to EFTs," the committee said.

Unfair Competition Cited

The committee said it confirms Adapso's position with regard to banks involved in DP activities.

"The possibility of unfair competition, incremental marketing and tie-in will grow further under the EFTS structure if banks do not use third-party processors to fill the data needs," according to the group's minutes.

"Our committee is concerned that large banks are already influencing the design and structure of a switch network."

Also "the confidence in eventual solution expressed by the private sector should equal or exceed that of the federal regulators to prevent their automatic inheritance of the DP function arising from EFTS," the committee said.

"The fear and emotional aspects of EFTS should be positively addressed by Adapso so as not to discourage the National Funds Transfer Commission or private suppliers from permitting the ad-

(Continued on Page 41)

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Independent Competition Cited

IBM Operating System Unbundling Seen User Benefit

By Edith Holmes
Of the CW Staff

NEW YORK – Users would benefit if IBM unbundled, or priced its operating system software separately, as it did its applications programs in 1969, according to Jerry Enfield, president of The Computer Software Co.

The unbundling of "systems control programming," as IBM termed its "Type I" or fully supported software in the late '60s, would encourage independent suppliers of software to evaluate the possibilities of developing operating systems for IBM 360s, 370s and any future systems, Enfield said in his testimony in the trial of U.S. vs. IBM.

Believing independents would elect to compete in the development and marketing of systems software if IBM put a price tag on its work in this area, he anticipated lower prices would result, thus assisting users.

At present, though, independents will pick up operating systems manufactured by the industry leader only after IBM has declared them "functionally stable," Enfield said.

With that declaration, users and software houses know IBM will add no significant new features to subsequent releases of the systems software.

As long as additional releases containing new functions are distributed free from time to time by IBM, he said, operating systems will continue to be variable targets for independent software vendors.

There would be no way to ensure profitability – to be certain of a return on the development costs incurred to make available a facility IBM had not yet released, he said.

A Convenient Package

There is no technological reason for bundling operating system software today, Enfield said. Bundling simply makes a convenient package.

That convenience encourages users to look to computer system manufacturers to supply them with operating systems, he noted.

By including and maintaining operating sytems with the hardware, IBM has compelled other systems manufacturers to do likewise, Enfield added.

If operating systems were unbundled, users would have the option of evaluating software against software as they do when selecting hardware today, he said.

Unbundling operating systems would change the way in which systems are marketed, he maintained.

Took Stand on Unbundling

Employed by IBM from 1964 to 1969, Enfield was on the Implementation Task Force that devised the details and the actual announcement of unbundling of certain services on June 23, 1969.

At the time, he told the court, he argued the corporation should price all its software separately if it was going to take that approach with any of it.

Enfield left IBM for The Computer Co., formed in February 1969, just following the unbundling announcement. Joining the firm as vice-president of development, he was instrumental in the design of improvements to IBM's Disk Operating System (DOS) for the 360 series.

His improvements became The Computer Co.'s primary product – the Extended Disk Operating System (Edos) – early in 1972 following IBM's December 1971 announcement of plans to declare DOS functionally stable for the 360.

Edos served users of 370 systems in addition to those of 360 models until IBM came out with a new operating system providing virtual storage capability – DOS/VS – in the fall of 1972, Enfield recalled.

The Computer Co.'s Development Division, including Enfield, left the company on June 1, 1973 to form The Computer Software Co. The group took with it the rights to Edos.

Since then, Edos installations have grown from 25 to 30 in 1973 to some 350 today.

Prior to the formation of The Computer Software Co. 80% of Edos installations were on 370 machines, Enfield recalled, today 80% to 85% are on 360s.

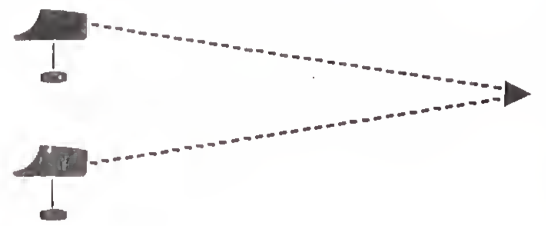
Much of the Computer Software Co.'s success is because of its emphasis on marketing enhancements to users whose equipment IBM had ceased to support with continued new developments, he said.

Success was also the result of linking the marketing effort to that of leasing companies by encouraging those firms to enhance their 360 portfolios with Edos capability, Enfield said.

Datapoint Dispersed Processing Systems-

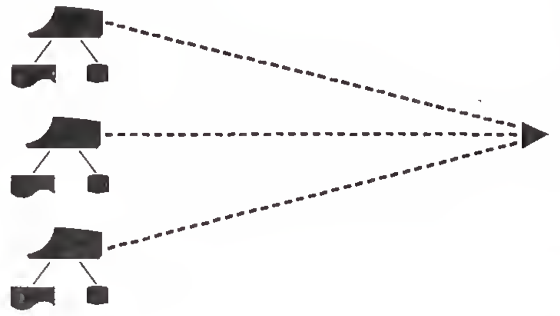
Diskette 1100: Intelligent data entry, local data storage, local processing and communications — these are the four basic requirements for dispersed data processing. The Diskette 1100 meets these needs with a unit combining a powerful general purpose computer, keyboard and video display plus up to four diskette drives yielding over a million characters of storage. Communications can operate with auto-answer and auto-dial in a variety of disciplines. With the Diskette 1100 field data can be entered and pre-processed locally before transmission to the home office computer. Input errors are minimized, home office computer efficiency maximized with this approach.

Dotted line indicates dial-up connection to home office computer



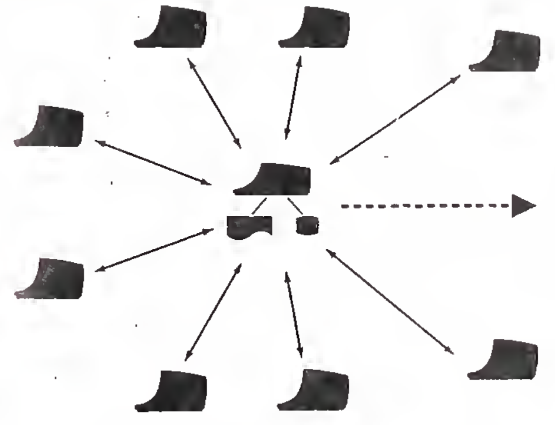
Datapoint 2200 with Cartridge Disks: As field office workload increases so does the requirement for more storage. The Datapoint 2200 with two cartridge disks offers over 5 million characters of on-line storage plus expansion capability to up to 4 disks to handle future growth. DATABUS programs written for the Diskette 1100 are fully compatible with the 2200 with Cartridge Disk so there's no need to start from scratch. Your initial programming investment still keeps earning money on the upgrade.

There's also a wide variety of peripherals to meet printing and other storage needs such as magnetic tape. Or you may continue with the peripherals used with the Diskette 1100.



8-User DATASHARE System: Now the workload is really getting large. Local office personnel are heavily involved with the creation and maintenance of their own files. They're handling a lot of the processing and utility chores that formerly required high-cost time on the home office mainframe to accomplish.

The 2200-based DATASHARE system will accommodate up to 8 users simultaneously, each running separate programs and accessing either private or master files. With this system, many phases of field office processing can be done concurrently: for example, users at some terminals can enter data to system files while others are running programs to generate reports or keep track of inventory. DATABUS programs written for earlier systems will also run here, saving development cost and time. Most importantly, field office personnel have instant access to local business data — there's no need to wait for the needed information from a home office file.

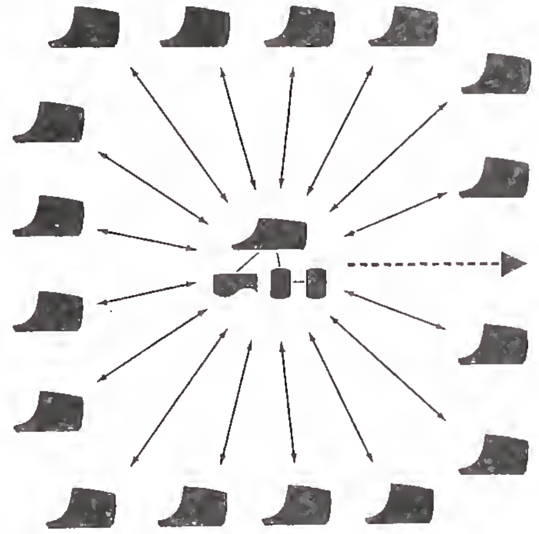


At the end of the day or between shifts, the local DATASHARE system can communicate with the home office computer and exchange field data, allowing home office and field personnel to work always with current, edited information, while data entry errors and transportation bottlenecks become a thing of the past.

16-User DATASHARE with Concurrent Communications:
The ultimate in dispersed data processing: A DATASHARE system using the Datapoint 5500 Advanced Business Processor providing up to 16 work stations and 200 million characters of on-line storage at the lowest cost-per-terminal in the industry.

The computing power of the 5500 provides more work capacity plus the ability to communicate with the home office while user terminals are operational. Files may be exchanged and system utilities and debugging routines run while DATASHARE use proceeds without interruption.

With its powerful computing capability the 5500 DATASHARE can handle all of the data processing requirements of a regional or manufacturing facility independently or work in conjunction with the home office computer, depending on what's most economical for the user.



Datapoint dispersed processing systems are designed for growth. We offer a variety of configurations, from small to large scale, which can be installed in scattered facilities of a company, depending on current work requirements. Not only can users pick and choose the precise configurations called for by current work loads in their various offices but they enjoy both modularity and upward program capability — that is, systems can be readily expanded to handle increased work loads while employing the programs created for initial configurations.

For the most efficient dispersed data processing, you need a true computer capability. You also need systems that can grow with you without the requirement for reprogramming. That's what you get from Datapoint's dispersed processing product line, the most complete in the industry and accompanied by a full roster of proven operating systems and programming languages. For the company that's in a growth phase in various locations, these systems constitute the optimum approach to providing the processor power needed in local offices, where it can be put to use most efficiently, while still allowing the economic advantages of centralized computer power. With program compatibility between Datapoint systems (and through emulation packages with any mainframe) it's the ideal way for growth companies to enjoy the advantages of a highly sophisticated yet highly practical automation at prices that constitute true economic breakthroughs for the industry.

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IBM Results 'Continued to Be Good' Through May

BOULDER, Colo. – IBM's operating results through May "continued to be good," following record first-quarter earnings and revenues, according to IBM President John R. Opel.

Addressing a group of securities analysts here, Opel said IBM is continuing to experience a "high rate" of outright sales of equipment in relation to leases, noting in Europe the rate of sales is "twice as high as in the same period in 1975."

IBM sales were at a record level in proportion to leases in 1975's fourth quarter and continued at a relatively high level in the first quarter, when net income rose nearly 25% to $544.4 million. Revenues during the same period rose almost 17% to $3.81 billion.

Opel credited inflationary pressures and tax credits for capital investment as the reasons for the maintained high level of sales, but added he didn't see any significant long-term effects on IBM.

"Thus far in 1976 all our operating divisions are doing very well indeed," he said. "All the indications are that these divisions will meet their objectives or come very close to them by the end of the year."

The General Systems Division (GSD), however, "is slightly below its sales plan, both in the U.S. and abroad," Opel said, but added GSD's pattern "is usually a slow first half year and a successful, whirlwind finish."

European Unit Results Up

Results of IBM's European unit were up 20% in 1975 and continue to make it "a star performer in 1976." The IBM executive said Operations in Latin America, however, are not doing as well because of "nationalism expressed in import restrictions," he said.

IBM continues to face increasingly tough competition, particularly outside the U.S. and notably in Japan where the government subsidizes its computer industry, Opel said.

With government subsidy, IBM's Japanese rivals "can settle for profit levels below anything tolerable to a risk-taking, open competitor," he added.

However, IBM's Japanese subsidiary "continues to do very well," Opel said.

Economic nationalism is developing in Europe too, but IBM's positions there remain strong, he said. There is nothing new to reports regarding a year-old investigation of IBM's operations by the Common Market, Opel added.

IBM's directors will decide the next dividend at their July meeting, after the quarterly report, rather than in June as in the past.

IBM Planning To Consolidate New York Plants

ARMONK, N.Y. – IBM plans to consolidate its Kingston, N.Y., manufacturing operations with other IBM locations by the end of 1978, turning over the Kingston site to the Systems Communications Division for a development center, the firm said.

The consolidation action affects about 1,000 employees, of whom 800 are expected to move to jobs in Poughkeepsie and East Fishkill, N.Y., and 200 are expected to choose to go to IBM facilities outside the area within the next three years, IBM said.

To supplement the Communications Division staff, about 150 people are expected to be transferred into Kingston.

As a result of intracompany transfer programs and an option for early retirement extended to Mid-Hudson Valley employees, IBM estimated about 1,000 employees will be leaving the firm's Mid-Hudson Valley facilities over the next three years.

The consolidation action is the result "of improved manufacturing efficiencies and continued advances in technology," IBM said.

The continuing trend toward denser integrated circuits has reduced the need for some traditional manufacturing assembly operations and has made possible more efficient circuit testing, the firm continued.

The Kingston plant currently employs about 4,700 people, 3,700 of whom are in the System Communications Division development center.

Production of the 370/115 and -125 and the Model 2821 control unit will be moved to Endicott, N.Y., while the 3270 display system and the gas plasma display and its electronics will be made in Raleigh, N.C., IBM said.

The early retirement program is similar to that offered previously on a companywide basis.

Firms Form Consortium

TOKYO – Fujitsu Ltd., Siemens and Amdahl Corp. have agreed to establish a consortium for collecting orders in Europe for large systems, according to a report in *EDP Japan Report*.

The systems will be provided by Fujitsu or Amdahl and the orders for peripheral and terminal units will be shared among the three firms.

Improper Payments Spotted at Sperry

NEW YORK – A special review of Sperry Rand Corp.'s international operations uncovered improper payments totaling about $2 million, the firm said.

The total includes direct payments by subsidiaries operating in four foreign countries totaling about $1.3 million in connection with foreign government business.

Independent distributors and agents of a foreign subsidiary in another country may have paid up to $416,000 in connection with government sales, the review showed.

In six foreign countries payments of about $300,000 were made during the four-year period reviewed "to facilitate governmental administrative action."

Shot at Close Range

Service Bureau President, Vice-President Killed

NEW YORK – The president and executive vice-president of a Long Island-based service bureau, Applied Systematics, Inc., were found shot to death in the company's Manhattan office recently.

A police spokesman said there are no suspects in the case.

Operations of the company have been assumed by Harold Gottfried, a member of the board who was named president. Salvatore C. Mineo Jr. was named executive vice-president.

The firm was founded about 1959 and went public in 1968, according to Gottfried. The company uses an IBM 360/40.

According to a report in the *New York Times*, the two men were found by a messenger at about 9 a.m., one slumped over a desk in one room and the other under a table in another room.

Police said there were no witnesses to the shooting, although another messenger heard "three bangs" about 30 minutes before the bodies were discovered.

Police indicated the men were shot at close range and "apparently knew their killer."

A former president of the firm, Joseph G. Cortale, was questioned in conjunction with the slayings, the article said.

Potter Units Reach Agreement On Terms of Debt Repayment

PLAINVIEW, N.Y. – Potter Instrument Co. and its subsidiaries, Potter Data Products Corp. and Potter Data Systems, Inc., have reached an agreement with the firm's general creditors committee for repayment of its debt.

The plan calls for settlement of about $9 million of claims covered by Chapter 11 for a combination of cash, notes and common stock.

Potter has been operating since April 1975 under Chapter 11.

Under the plan, those creditors owed under $300 would receive payment in cash. The others would receive 8% of their claims in cash and 12% payable in notes for 10 equal quarterly installments as well as Potter common shares for the remaining 80% of their claims at the rate of one share for each $2 of debt.

The plan must be approved by 51% of general creditors, "both in number and in dollar amount," and should be confirmed by the Bankruptcy Court, the firm said.

In addition, the plan is contingent on certain changes in the company, such as an increase in authorized securities, which requires stockholder approval.

Potter also owes about $20 million to institutional lenders which are secured creditors and aren't part of the Chapter 11 agreement. Since filing bankruptcy, Potter has repaid about $2 million to institutional lenders, the firm said.

The firm said unaudited financial information for the year ended June 30, 1975 "indicates substantial write-downs in inventory, off-lease equipment and other areas may be required."

ICL to Expand in U.S.

NEW YORK – International Computers (USA) Ltd. (ICL) plans to expand the geographic scope of its efforts in the U.S.

The timetable will be determined by the method chosen, either through acquisition or by itself, according to Eli Hiller, acting president.

For the moment, the firm is operating in the N.Y. metropolitan area, but has expanded its product line to include the 2904, which he said is in the range of the IBM 370/115 and -125.

MDS Forms Market Program

PARSIPPANY, N.J. – Mohawk Data Sciences Corp. (MDS) has formed a national/international accounts marketing program to be directed from its headquarters here.

The MDS program will provide a centralized focal point to more effectively support the hardware, software and service needs of MDS' accounts, according to an MDS spokesman.

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For you 900 or so persons who are planning to buy a DEC system in the next two years, we heartily endorse your judgment. We have, in fact, three DEC system 10's in-house. But if you contact us now, before you close your deal, you have an excellent chance to improve your DEC system cost and operating picture.

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There are no hidden tricks in this proposition. Others have already taken advantage of it. For full information, including costs, call your nearest Grumman Data Systems products representative. Or write Joe McDonough, Grumman Data Systems Corporation, 45 Crossways Park Drive, Woodbury, New York 11797, (516) 575-3034.

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Second Fortune 500 Bruised Badly by '75 Recession

NEW YORK – The recession battered the second 500 largest industrials in 1975 as badly as it did the first 500, according to *Fortune* magazine.

Total profits for the Second 500 fell 12.8% in 1975; 57 companies on the list lost money, including Mohawk Data Sciences ($25.9 million loss), Bunker Ramo ($13.8 million), California Computer Products (Calcomp) ($13 million) and Electronic Memories & Magnetics (EMM) ($2.2 million).

The median return on stockholder's equity for the Second 500 was 11.2% vs. 12.7% in 1974. Memorex posted the highest return on stockholders' equity – 583%.

That figure reflects a very good year for Memorex, *Fortune* said, but it also reflects a shrinkage of the company's equity base during the prior four years of losses.

Telex was second in terms of return on stockholders' equity, but boasted a return of 70.2% in comparison with Memorex. Third in the second 500 was Sanders with a return of 63.3%.

The median in changes in sales for office equipment was the second highest in industrial categories, with a 12.1% rise. However, this same category ranked near the bottom in median changes in profits, scoring a 21.3% decrease.

DP newcomers to the second 500 in 1975 included Bunker Ramo at 513, Data General, 909; Telex, 944, Storage Technology, 969, and Data 100, 982.

Dataproducts was ranked in spot number 984 followed by Cubic, 998. EMM rounded out the slate at 1,000.

Departures from the listing included Ball Computer Products, Foxboro Co., Perkin Elmer and Tektronix, all of which moved up to the first 500, and Hazeltine, which dropped off the end of the list after being 980 in 1974.

Behind Bunker Ramo, the computer industry leader in the second 500 at 513, Memorex rose 59 places to 541, Ampex dropped 38 to 551 and National Semiconductor rose 38 to 579.

Sanders followed at 677 and Mohawk Data Sciences was 705. Intel rose 12 places to 794 while Calcomp dropped 24 to 844.

Role of Private Sector in EFTS Endorsed by Adapso Committee

(Continued from Page 37)

vance in EFTS," it added.

Turning to the other problem areas, the Adapso committee said there needs to be "a clear understanding and expression of legal liability for errors or delay occasioned by errors contained on the magnetic tape which cannot be read by the Adapso member DP center . . . the interjection of DP servicing companies into the chain of electronic transfers of funds will require new legal and contractual study," the report said.

The committee said it intends to work with the Adapso committees on audit and privacy, but will avoid those controls that relate to personal identification, possible card duplication, release of personal ID numbers and other potential means of misusing a system.

Work in this area is being done by other committees such as the U.S. Savings League, the committee said.

"With respect to privacy considerations, the current avalanche of computer data on individuals and possible wrongful releases of such information will be amplified to the extreme in an era of electronic funds transfer," the group said.

In outlining the five stages of the growth of EFTS, the committee also enunciated its belief in the growth of the private EFTS sector.

The committee is concerned with transfers by means other than a printout or card punch.

The first stage is defined as any transfer from one account to another within a financial institution.

Stage two is transfer of financial information from sources external to the financial institution.

The committee envisions the third stage starting on a local basis, as opposed to a nationwide switching network first established by federal instrumentality or a utility.

The third stage is interchange of information among financial institutions.

From there, the next procedure is extension of financial institution functions to remote locations. The Adapso committee feels point-of-sale (POS) terminals should be accessible by all financial institutions.

The final stage is defined as "extension of retail data processing function to computers located in financial institutions or to the data servicers who service financial institutions or even possibly to the computers located at the switching centers."

The committee emphasized its intent to work with the National EFT commission in a positive approach rather than through negative position papers.

In response to a request from the commission for a profile of Adapso's membership, the committee has disseminated a questionnaire to that body.

Various members of the committee agreed to conduct further study in various areas including the need for remedial legislation to define branching authority to clear way for unmanned and POS terminals.

Other areas assigned were security, liability, the role of regulatory authorities and liaison with other EFTS interest groups.

Tymshare Expands in Europe

CUPERTINO, Calif. – Tymshare, Inc. has signed a memorandum of intent with Credit Lyonnais, a French bank, to acquire a 20% interest in Sligos S.A., a French DP services company, for about $3 million cash.

Tymshare also reached an agreement in principles to increase its equity ownership in its French affiliate, Cegos-Tymshare, from 20% to 45%, for about $1.1 million.

DP has a ubiquitous terminal condition.

A special report on *Data Communications Terminals* in the July 26th *Computerworld.*

The dollar value of the U.S. installed base of both general and special-purpose terminals should increase to $25 billion by 1980, *$20 billion of which will be shipped in the next five years.* (based on estimates by International Data Corporation, the world's largest EDP market research firm). Clearly, more users than ever before are relying on terminals to provide solutions to complex problems, while increasing the utility and accessibility of their computer systems.

Computerworld will present a special report on Data Communications Terminals in the July 26th issue, including teleprinters, CRTs and intelligent terminals. Edited by Ron Frank, this supplement will cover a variety of topics of importance to data communications users with application stories and tutorials throughout.

For example, we'll report on how new carriers and carrier services might affect the way terminals are used. We'll look at what applications require terminals with "intelligence" - i.e., processing logic and memory - and show you some of the best ways to make use of this hardware. We'll investigate what's being done to make the terminal environment easier to use. This includes items on recent teleprocessing software enhancements and new hardware features, to name a few. In addition, we'll report on where terminals are headed, and analyze what's been happening to the cost of terminals.

If you're involved with data processing, this is one subject you may want to be very familiar with. Don't miss it. It's in the July 26th *Computerworld*. If you're a terminal manufacturer, you should advertise here. Don't miss the July 9th ad closing. Call your *Computerworld* salesman for more details. Or call Judy Milford at (617) 965-5800

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Basic Timesharing Expects To Double Base in 1976

By Esther Surden
Of the CW Staff

SUNNYVALE, Calif. — While Basic Timesharing, Inc. has an installed user base of only 160 mini systems, the firm expects to ship 200 systems this year, according to Peter Johnson, market development manager for the firm.

The firm's dollar volume is growing at a rate of 50% per year and Basic has experienced a five-fold growth in personnel in the last two years, Johnson said in an interview here.

The firm began in 1968 as a time-sharing service with the owners developing new hardware and software. By 1970 they had a minicomputer system to sell, Johnson said.

The systems are in use in educational institutions and service bureaus, but the firm is thrusting into the commercial marketplace this year, Johnson said.

"Our skills are in putting together a time-shared system," Johnson said, and the firm offers no applications programs except those jointly marketed by Basic and its customers, Johnson said.

"Until recently the typical user had to have a computer background and had to know about application programming to understand the unique qualities of the system," Johnson said.

However, with the parallel marketing of applications packages, Johnson feels this all will change. The firm is presently joint-marketing a data accounting package developed by one of its customers and a school administration package, he said. The firm intends to market more of these in the future.

Many of Basic Timesharing's customers want to do their own jobs and go into the service bureau business on the side, Johnson said.

Software updates are performed on the system every three months, Johnson said, and customers are encouraged to take advantage of new software releases.

Service on the system is handled remotely, he continued. Basic dials into the system over telephone lines and runs the diagnostics.

If a patch is needed, it can be installed over the telephone, and if a hardware part must be replaced, Basic ships it to the user and it can be replaced with relative ease, he said.

The operating system is Basic's biggest contribution to the system, Johnson said. The user has "no access to the source code of the operating system," he added.

A unique advantage to the application software vendor is that "just as we can dial into the system from here to do diagnostics, we offer a similar capability to the applications software vendor," he said.

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Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

Data communications has become a focal point for new growth, and new economies, in computer use. But there are many hazards for the user. Even many up-and-running systems have costly flaws that can be improved through better management methods. And that's where these seminars come in.

Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

1. **Data Communications Course #1010 — Practical Data Communications Systems and Concepts.** Led by Dr. Dixon Doll, this two-day seminar is designed for people who are relatively new to data communications. It presents you with a comprehensive exposure to the important terminology, economic aspects, and functional characteristics of contemporary data communications devices, techniques and systems. Money-saving ideas are an important part of this seminar, and you will see how to implement them using innovative techniques like split-stream modems, diagnostics for fault isolation, modem-sharing devices and digital bridges, remote multiplexers, concentrators, and front-end preprocessors. The seminar will focus on the latest developments in data communications, such as SDLC, IBM's new Synchronous Data Link Control, DDS, Bell's new digital data network, and HiD-LoD, Bell's newly effective tarriff for voice lines. And we'll look at the impact of satellite carriers and specialized carriers as well. This seminar will give you the ability to recognize and solve specific problems in data communications so that you can effect cost savings and performance improvements at your installation.

2. **Data Communications Course #1020 — Advanced Teleprocessing Systems Analysis and Design.** Course 1020 will give you an in-depth familiarity with techniques for planning, designing and managing cost-effective commercial data communications networks. Class study and discussion of specific telecommunications problems affecting your organization is an important part of this three-day seminar, and you'll have the opportunity to present such problems for analysis by the instructor and class members. You will also participate in project teams assigned to individual data network case studies, and you'll see what approaches have been taken by other organizations with networking problems similar to your own. Like Course 1010, this seminar will focus on recent developments in data communications. But Course 1020 will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithims for determining line speeds, number of ports, the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Procter & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

To enroll, look over the schedules below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

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CIRCULATION DEPARTMENT

Brazilian Firm Threatens to Sue Cincom As License Contract Dispute Continues

By Donald Best

Special to Computerworld

SAO PAULO, Brazil – Although Cincom Systems, Inc.'s attorney maintains the license contract between the software vendor and Deltacom, Sistemas de Informacao S/C Ltd. was canceled in January, Deltacom has indicated it is prepared to take legal steps to defend the validity of the license.

Cincom's attorney in its U.S. headquarters said the Deltacom position is totally without merit. The agreement between the two firms provided for 30-day cancellation by either party, which Cincom chose to exercise in mid-December, he said.

Cincom has since appointed Sistemas, Computacao e Informatica as its Brazilian representative [CW, June 7].

The Cincom attorney indicated much of the problem between Cincom and Deltacom, formerly known as Deltacom do Brasil, stemmed from a lack of reports on installations of Cincom software made by Deltacom.

Deltacom has notified 33 of its clients about its intention to file litigation against Cincom and present documentation claiming the original license agreement signed between Cincom and Deltacom on May 1, 1973 is still "valid and binding."

Under the terms of that contract, Daltacom was named Cincom's representative with exclusive marketing and service rights to all Cincom products in Brazil.

Royalty payments were to be remitted to Cincom in the U.S. based on a fixed value per product equivalent to 50% of the U.S. sale price regardless of whether the software was sold, leased or rented in Brazil.

Royalty Snafu

Ivan T. George, president of Deltacom, said in an interview that "royalty payments were not, in fact, carried out, because approval could not be obtained from the National Institute of National Ownership (Inpi)," the agency which, together with the Central Bank, approves the remittance of royalties in all cases designated "transfer of technology."

According to the correspondence circulated among Deltacom clients, Inpi refused to classify the importation of software as "transfer of technology" and declared instead that such transaction "characterizes a sales representation with commercial aspects."

Under these conditions, George said, Deltacom "cannot make royalty remittances abroad without Inpi registration.

"Deltacom's inability to make royalty payments at this time," George said, "does not represent a breach of our contract with Cincom because current Brazilian law makes the execution of the royalty clauses impossible."

Cincom has cited Deltacom in a judicial summons in Sao Paulo, claiming Deltacom owes back royalties of $521,278.

Foreign Orders & Installations

Bank of Credit and Commerce International SA has ordered two NCR Century 151 systems for the bank's main office in London, two Century 151 processors and visual display units for use in Abu Dhabi and two Century 8200 minicomputers for use in branch offices in Teheran and Beirut.

DAF Trucks N.V. of Eindhoven, The Netherlands, has ordered a Production IV manufacturing management system from Informatics, Inc.

F.W. Woolworth has ordered two computerized retail systems from NCR, including 56 NCR 255 terminals, two NCR 726 in-store minicomputers and four NCR 250 electronic cash registers, for two Woolco stores opening in the UK.

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The $4.4 Billion German Computer Market And How To Reach It:

The German computer market is the largest in Europe and the third largest in the world. In 1976 German computer users will spend an estimated $4.4 billion for data processing. Studies show that the 5,000 largest EDP user sites account for 65% of this spending, so like the United States, Germany's computer market is highly concentrated in the larger, professional computer sites.

IDC Deutschland (one of Germany's largest market research and consulting firms) projects that the average growth rate of computer systems sales in Germany will be 14% through 1977, but the growth of certain segments of the market will be much greater. The rate for minicomputers and data communication terminals will be more than 30%. Software and services will experience an annual increase of 20-30% while data entry equipment is expected to show a sales increase of 25% per year.

Computerwoche, the EDP weekly for the German computer community, reaches the people who control the computers in this $4.4 billion market. With a circulation of 21,000, *Computerworld's* German sister publication, serves German DP professionals with the same editorial excellence that has made *Computerworld* a leading EDP publication in the United States.

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1980 Mass Memory Mart Predicted at $2 Billion

SANTA CLARA, Calif. – "By 1980, mass memory storage of archival information could be a $2 billion a year market," predicted Charles Missler, chairman of Precision Instrument here, which has developed a laser mass memory.

Because of both the performance and cost benefits, "we expect permanent storage to make a large dent in the computer memory market for large installations," Missler said.

The unused computerized files in this country are costing big business and government "an arm and a leg," he continued.

Tapes Not Inexpensive

In fact – and most executives don't know – magnetic tape is as expensive as the paper it replaced for archival storage of data, Missler said.

Tapes are expensive to maintain, degrade over time and are vulnerable to loss, error and malicious mischief," he explained.

"The manpower and errors that result from magnetic tape are one of the major costs associated with DP," he added.

In addition, a magnetic tape reel that costs only $10 in large bulk quantity purchases can cost as much as $20 to $25 per year when all expenses are tallied, he pointed out.

These include tape librarians, the cost of leasing special air-conditioned and filtered office space, error corrections and rehandling to avoid tape deterioration, Missler said.

Precision Instrument's memory storage media is both cheap and permanent, he said.

Instead of a recording head, a finely focused laser beam shoots permanent, nonerasable microscopic holes into a thin film of Rhodium on a polyester sheet called a Data Strip, he explained.

"Using such a method, 200M bytes of information can be stored for $22 as opposed to over $100 for the same amount of data on a magnetic tape reel," he said.

"But the major advantages are the additional savings because reels do not have to be changed or maintained."

Such mass memories can be used for data and/or graphic illustrations and the cost differential is so great that it is less expensive to record again all of the information on disposable Data Strips, he observed.

"You would still come out way ahead," Missler claimed.

Permanent Memory Benefits

"Traditionally, the industry has been limited to erasable memory such as magnetic tape or disk and has assumed that a permanent system would be a disadvantage.

"But now, people are coming to recognize the benefits of permanent memory, since it is not subject to alteration by a disgruntled or dishonest employee or to inadvertent erasure due to human error, power failure or equipment malfunction," he continued.

Laser mass memory technology has been up and running in classified government applications and has just been released for commerical uses, he noted.

Earnings Reports

SPERRY RAND
Year Ended March 31

	1976 (000)	a1975 (000)
Shr Ernd	$4.00	$3.54
Revenue	3,202,556	3,040,862
Earnings	145,294	b125,233
3 Mo Shr	1.08	1.04
Revenue	894,597	823,237
Earnings	41,187	36,773

a-Restated to reflect accounting change for translations of foreign currency. b-Includes $5.44 million gain on sale of land.

STORAGE TECHNOLOGY
Three Months Ended March 26

	1976	a1975
Shr Ernd	$.33	$.26
Revenue	27,343,000	20,410,000
Earnings	1,406,000	1,046,000

a-Restated.

T-BAR
Three Months Ended March 31

	1976	1975
Shr Ernd	$.16	a$.14
Revenue	1,305,207	1,102,100
Earnings	85,404	73,071

a-Adjusted for five-for-four stock split in April 1976.

TALLY
Three Months Ended March 28

	1976	1975
Shr Ernd	$.19	$.01
Revenue	6,112,000	4,432,000
Tax Cred	378,000	35,000
Earnings	658,000	28,000

TECHNITROL
Three Months Ended March 31

	1976	1975
Shr Ernd	$.20	$.16
Revenue	5,117,000	4,432,000
Earnings	a264,000	214,000

a-Includes $59,000 from sale and revaluation of investments.

TEXAS INSTRUMENTS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.93	$.61
Revenue	369,367,000	332,757,000
Earnings	21,287,000	13,992,000

TRACOR
Three Months Ended March 31

	1976	1975
Shr Ernd	$.66	$.46
Revenue	27,852,000	22,995,000
Tax Cred	652,000	528,000
Earnings	1,698,000	1,123,000

VARIAN ASSOCIATES
Three Months Ended April 2

	1976	1975
Shr Ernd	$.32	$.28
Revenue	85,145,000	76,893,000
Earnings	2,257,000	1,917,000
6 Mo Shr	.55	.49
Revenue	164,117,000	149,582,000
Earnings	3,916,000	3,379,000

WANG LABORATORIES
Three Months Ended March 31

	1976	1975
Shr Ernd	$.21	a$.03
Revenue	22,947,000	17,413,000
Earnings	1,102,000	170,000
9 Mo Shr	.64	a.35
Revenue	65,195,000	51,309,000
Earnings	3,263,000	1,785,000

a-Adjusted to reflect common stock dividend on April 9, 1976.

WANGCO
Three Months Ended April 3

	1976	1975
Shr Ernd	$.50	$.10
Revenue	8,162,105	4,279,620
Earnings	552,619	110,161
6 Mo Shr	.96	.31
Revenue	15,200,358	9,080,773
Earnings	1,060,287	324,253

TYMSHARE
Three Months Ended March 31

	1976	1975
Shr Ernd	$.39	$.31
Revenue	18,443,597	14,034,946
Tax Cred	......	100,000
Earnings	1,583,092	1,185,266

WESTERN DIGITAL
Three Months Ended April 3

	1976	1975
Revenue	$2,101,000	$2,844,000
Loss	433,000	752,000
9 Mo Rev	7,605,000	8,399,000
Loss	1,569,000	1,212,000

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PROJECT Leader NYC-STK transfer-EFTS-EMP Bnfts $21-23M
PROG ANAL-BAL/OS banking, deg. $18-21M
PROG ANAL-NY/NJ BAL On line commercial applications $17-21M
SOFTWARE-NY-OS/MFT-MVT HASP 3.1-4.0 $21M
SYSTEMS ANAL PROG-CONN-learn IMS OS deg $17-20M
OPERATION RESCH Prog Anal-Fortran/Basic $15-18M
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position announcements

Computer Technology Faculty Position

The Purdue University School of Engineering and Technology at Indianapolis is seeking candidates to fill a position in the Computer Technology Department at the Assistant Professor level beginning January, 1977. M.S. degree and five years of relevant teaching and industrial experience required. PH.D. desirable. Position responsibilities include full-time teaching in Associate of Applied Science and Bachelor of Science curricula. General systems experience is preferred. Some expertise in mini-computers/microcomputers would be helpful.

Applications must be received by August 31, 1976. Send to:

Dr. Robert G. Crozier, Purdue University School of Engineering and Technology, Indiana University-Purdue University at Indianapolis, 1201 East 38th Street, Indianapolis, Indiana 46205.

THE OLDEST LIFE INSURANCE COMPANY IN AMERICA

Offers an existing opportunity
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360/370 assembler language
send resume and salary history to:
Mr. Robert M. Meeker
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position announcements

SR. PROGRAMMER/ ANALYST

Major financial institution in search of an individual with one or more years OS/DOS COBOL experience. IMS or AL would be a plus. $15,000 FEE PAID.

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Senior Software Specialists GERMANY

The German subsidiary of one of Europe's largest software consulting and data processing service companies has an immediate need for senior level personnel in its consulting division. Experience in systems programming, the design and development of operating systems, teleprocessing, large-scale multi-CPU communications networks, or minicomputers is required. Preference will be given to those who have knowledge in German. Attractive compensation package and moving expenses are provided. Moderate travel and periodic relocation within Germany is to be expected. Please forward your resume and salary history to

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Spend some time in Europe

CACI, Inc., the established 14 year old international leader in Database Consulting is seeking Senior Systems Programmers, Systems Engineers and Independent Consultants with in-depth experience in Database – preferably IMS. There are a variety of exciting Database assignments in Italy, Spain, France, Scandinavia and Britain involving performance monitoring, Database and TP systems tuning, evaluation of competitive systems, and complex Database design. Excellent salary, liberal expenses + profit sharing.

SEND RESUME TO:

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C.A.C.I.

WORLD VISION INTERNATIONAL

WVI is a Christian humanitarian organization dedicated to overseas ministries in childcare, social action, leadership development, emergency aid and evangelism. WVI currently has openings for three positions. You would work in a challenging environment with Christian data processing professionals.

ANALYST/PROGRAMMER

Senior level person to aid in the development of an on-line system for a new DECsystem-20 configuration. Desirable experience is at least five years in development, COBOL programming and implementation of large projects. Experience with data base administration is a definite plus.

SENIOR PROGRAMMER

This position requires five years experience with both financial and management systems plus COBOL programming. Experience with MSA general ledger and on-line systems is a definite plus. This person would support the MSA general ledger system on DOS and help design and implement future financial and management systems for a DECsystem-20.

ASSISTANT MANAGER OF DATA ENTRY AND MAIL HANDLING

Challenging opportunity to assist the manager of a department of 60 people. Responsibility includes data entry, mail handling and analysis. Desire some technical knowledge and some experience with an on-line system. Must have ability to manage people.

IMMEDIATE OPENINGS

Qualified applicants should send their resume to:
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Director, Data Systems

World Vision International
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Monrovia, CA 91016

PROGRAMMERS
PROGRAMMER/ANALYST

Large financial institution is currently seeking qualified programmers and programmer analysts to support our needs for new commercial applications.

We offer an excellent Mid-Atlantic location, competitive salaries and a comprehensive fringe benefit program as well as a state-of-the-arts environment utilizing IBM 370/158 hardware. OS/VS-1, programming predominantly in Cobol. T/P exposure helpful but not essential. Two years practical working experience required. If you qualify and are interested send your resume, indicating salary history to:

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P.O. Box 27025
Richmond, Virginia 23261

FPL
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SYSTEM PROGRAMMER UNIVAC SERIES 70

Florida Power & Light has an immediate opening in the Computer Systems and Programming Department in Miami.

Candidates must have a minimum of five years programming experience of which two years were supporting VMOS or VS9 software and program products, SYSGEN experience on VMOS 10 or VS9, experience in configuring and managing Disk Space in a time sharing environment, and be proficient in ASSEMBLY language. Knowledge of COBOL and FORTRAN language is desirable.

We offer an attractive geographic location, career potential and an excellent benefit program.

Qualified candidates who wish to be considered for the above position should submit a personal resumé including salary history in confidence to:

A. M. STRICKLAND
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P. O. BOX 013100
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AN EQUAL OPPORTUNITY EMPLOYER M/F

PROGRAMMER/ ANALYSTS

Mallinckrodt, Inc., a broadly diversified pharmaceutical and chemical manufacturing corporation, is searching for achievement oriented programmer/analysts to meet rapid growth requirements within our Management Information Services Division.

We are seeking user-oriented people with applications experience in financial, manufacturing or marketing areas. Desired background includes 2-5 years experience in a systems and programming group, a college degree and a working knowledge of ANS COBOL.

Mallinckrodt is a rapidly growing corporation with terminals currently installed in four of our eighteen domestic manufacturing facilities. Installed system is a 370/145 using DOS/VS.

We offer an excellent starting salary, comprehensive benefits programs, including a dental program and a liberal relocation policy.

Qualified applicants please send resume including salary history to Mr. J.N. Hogenmiller, Corporate Employment Department

Mallinckrodt

P.O. Box 5439 **St. Louis, Mo. 63147**

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Senior Systems Programmer

The University of Missouri Computer Network is seeking a qualified individual to join the basic systems programming staff. Basic duties will include integration, installation and maintenance of major applications systems including SPSS, SAS, MARK IV, LIBRARIAN, etc., and participation in the continuing evolution of the Computer Network's operating system.

The University of Missouri Computer Network serves the entire general purpose computing needs of the four compuses of the University and various outside organizations. Service is provided by an IBM 370/168 and 370/158 operating under MVS-JES2 with MAS, and supporting TSO, IMS and ATS.

Applicatns must have a bachelor's degree and three to five years of appropriate experience. (Candidate not having a degree must have a total of at least seven years applicable work experience.) Ability to communicate with user oriented computer professionals located on the four campuses is also necessary.

Send resume to: University of Missouri - Columbia, Personnel Services, 309 Hitt Street, Columbia, MO 65201. *An Affirmative Action Equal Opportunity Employer.*

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System support position available at our general offices in Minneapolis. Work experience with IMS internal code, DBD/PSB gen or MFS required. Data dictionary experience helpful. Starting salary based on applicable experience. Excellent fringe benefits including air travel. Send resume detailing above experience to:

Industrial Relations
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Requires 2 years of IMS experience.

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Los Angeles, Calif. 90010
(213) 380-2200

CO-ORDINATOR OF ACADEMIC COMPUTING SERVICES

Academic Staff position at University of Wisconsin-Platteville. Responsibilities include the coordination and promotion of computer use by various departments and colleges and the supervision of the Academic Computing Systems (DEC PDP 11/40, IBM 1130, and RJE Remote to IBM 370). The applicant should have a M.S. degree in Computer Science or a related area. Experience in timesharing is desirable. UW-Platteville is an equal opportunity employer. Interested persons should send a complete resume and reference no later than July 15, 1976 to: **F.J. Lofy, Chairman, Search & Screen Committee, University of Wisconsin-Platteville, Platteville, Wisconsin 53818.**

ASSISTANT MANAGER
Data Processing Center

The National Academy of Sciences is seeking an individual with management capability as well as extensive systems programming experience to work with installed IBM 370/135 computer system with video terminals operating under DOS/VS utilizing CICS and ATMS.

Work involves responsibility as Asst. Data Processing Manager, DOS/VS systems generation and maintenance including CICS and ATMS, application program maintenance and technical assistance to programmers. A background in Statistics, Accounting for Computer Science is desirable, as well as five years in ALC programming and supervision.

Salary up to $23,000 depending upon qualifications. Submit resume to:

Mr. U H. Leach, Manager
Data Processing Center
National Academy of Sciences
2101 Constitution Ave., N.W.
Washington, D.C. 20418
Equal Opportunity Employer

PROGRAMMERS
SYSTEMS ANALYSTS

Seattle, Metro, is seeking applicants with programming/systems analyst experience to provide systems support for its water pollution and transit projects. A bachelor's degree in a relevant field or the equivalent experience is required. In addition, applicants must have one - five years of experience which must have included one or more of the following: Fortran, PL/I, BAL or COBOL, OS, & OS-JCL on large scale equipment (360-40 level or higher). These positions will be responsible for the development and support of the online and/or batch systems required to satisfy [illegible] applications (i.e. Payroll, [illegible], Transit Scheduling, [illegible] Data Base, etc.). [illegible] depending upon [illegible]. Please send resume [illegible] Employment Of[illegible] Avenue, Seattle, [illegible] Seven positions [illegible] and filled [illegible]

[illegible]

---

senior programmer analyst
Portland, Oregon

[illegible]

Portland
General
Electric
Company

DIRECTOR OF COMPUTER RESOURCES
Medical University of South Carolina
Charleston, South Carolina

Description: The Medical University of South Carolina invites nominations and applications for the position of Director of Computer Resources, the person with the principle responsibility for development and coordination of computer resources at the Medical University. The Medical University, located in Charleston, is comprised of Colleges of Medicine, Dental Medicine, Graduate Studies, Pharmacy, Nursing, Allied Health Sciences, and a 502-bed hospital. There is a current enrollment of 2,216 students. Some 615 faculty members are employed full-time and over 500 practicing professionals are on the clinical part-time staff. The total number of employees is approximately 5,000. **Qualifications:** Nominees and applicants should have a broad knowledge of computer systems, in general, experience in the health professions, and the ability to provide leadership in the application of computer technology among the health professions at the Medical University of South Carolina.

Please send letters of application or nomination and a resume to:

Dr. William E. Groves
Chairman, Search Committee for Director of Computer Resources
Office of the President
MEDICAL UNIVERSITY of SOUTH CAROLINA
80 Barre Street
Charleston, South Carolina 29401

The deadline for applications or nominations is July 31, 1976. The Medical University of South Carolina is an Equal Opportunity Employer.

SYSTEMS ANALYSTS & PROGRAMMERS

Information Systems Organization has outstanding opportunities for Design Specialists, Senior Programmer Analysts, and Computer Programmers interested in positions offering the potential for rapid career advancement. Preference will be given to candidates with:

- IMS online/batch experience uitlizing COBOL.
- Background experience in material, logistics, manufacturing, business and engineering applications.

Education should include a BS/BA degree in Business or the equivalent in experience.

Send Resume to:

Professional Employment — Dept. CW
B-1 Division
Rockwell International
5701 W. Imperial Highway
Los Angeles, Calif. 90009

Rockwell International

An Equal Opportunity Employer

Operations Supervisor

NCR CENTURY shop is in need of experienced individual to take complete responsibility for around-the-clock computer operations. We presently have two CENTURY 201 systems that will be replaced soon with two CRITERIONS as we move towards continuous on-line services for the banks in our holding company. Familiarity with NCR's B1, B2 and B3 operating systems is desired as is supervisory experience. Send resume to:

NB SERVICE CORP.
P.O. Box 7667
Charlottesville, Virginia 22906

PROGRAMMER/ ANALYST

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Growing organization needs ambitious individuals to fill positions in top-flight data processing operation requiring one or more years programming experience, thorough knowledge of COBOL, and IBM OS/JCL required.

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COMPUTER HARDWARE ANALYSTS

Information Systems Organization has outstanding opportunities for hardware planning and evaluation analysts. Positions offer the potential for rapid career advancement. Preference will be given to those with experience in the following:

- Remote Terminal and other peripheral hardware evaluation.
- Selection of equipment which best fits user requirements.

Education should include a BS/BA degree in Business or the equivalent in experience.

Send resume to:

Professional Employment-Dept. CW
B-1 Division
Rockwell International
5701 W. Imperial Highway
Los Angeles, Calif. 90009

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PROGRAMMER

MINNEAPOLIS — Progressive Health Care services organization seeks PDPII minicomputer programmer. Experience with Fortran and Macro under RSX-11 operating system in a real time business applications environment helpful. Position offers attractive starting salary and excellent benefit package. Send resume in strict confidence to:

P.O. Box 1228
Minneapolis, MN 55440

PROGRAMMER OR PROGRAMMER ANALYST

Large rapidly growing midwestern financial company has opportunities for experienced data processing personnel.

PROGRAMMER ANALYST — 1 to 3 years systems and programming experience using COBOL under OS. Insurance experience preferred but not necessary.

Also seeking mini-computer programmers and programmer analysts to participate in the development of a data capture system. Assembly language programming is a must, Datapoint experience is a plus.

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Employee Relations Department
St. Paul Fire and Marine
Insurance Company
385 Washington Street
St. Paul, Minnesota 55102

The St Paul

An Equal Opportunity Employer

Project Manager

Chicago-area college needs Project Manager. Minimum four years Data Processing, with emphasis on designing and implementing systems on 360/370 or compatible computers. Experience with ANS COBOL and college application desired. Responsibilities involve leading a team of programmer/analysts in software development. Excellent fringe benefits. Salary commensurate with experience. Send resume with salary history in confidence to:

CW Box 4686
797 Washington St.
Newton, Mass. 02160

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Would you like to live in an area that offers clean air, bountiful recreation and a good environment to raise children? Immediate opportunity for self-starter to work on Burrough's B 4700 and IBM 370 systems.

Requirements include: 3 to 5 years Analysis and Design experience, heavy COBOL background a must, IBM assembler a plus, IBM DOS/VS and/or Burroughs MCP knowlege desirable

We offer a competitive salary commensurate with experience. If you meet the qualfications please send your resume and salary history to: **CW Box No. 4685, 797 Washington St., Newton, Mass. 02160.** *EOE*

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PROGRAMMERS and ANALYSTS

14 - 22K

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Immediate opening for Programmer/Analyst for intermediate EDP installation converting to an on-line manufacturing control system. Exp. in CICS, DOS/VS, COBOL, RPG & DBOMP. Send resume including salary history to Jane Franke, Employment Manager. . .

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SYSTEMS CONSULTANT

Cameron University has opening for a Systems Consultant with COBOL and RPG experience, preferably on HP 3000 System. Must be able to write reports as well as programs. Degree in Business required. Please send resume and salary requirements to:

Dale Sare
Director of Data Processing
Cameron University
2800 Gore Blvd.
Lawton, Oklahoma 73501
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DATA BASE ADMINISTRATOR

Arizona State University has a university data base administrator position open, effective August 1, 1976. DMS 1100 and system 2000 are being considered for use on the university's Univac 1100/42. Several applications are being designed which will require the use of a DBMS. Master's degree required, PHD preferred, management experience necessary. Application period ends July 15, 1976, send all inquiries to Arizona State University, Personnel Dept., Academic Services Bldg., Tempe, AZ 85281. *An Equal Opportunity Employer.*

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Our second position requires an individual with approximately 5 years of systems analysis and programming experience in a manufacturing environment using IBM OS/VS with COBOL as the primary language. Candidate will be required to perform all aspects of systems development for definition of systems requirements through programming and systems documentation.

For both positions a degree is preferred; however, related practical experience will be considered as an alternative.

We offer excellent starting salaries, full benefits, and real opportunities for advancement in our challenging, sophisticated EDP environment. For confidential consideration, please forward your resume, including salary history and requirement, to: JANET ROBB, EMPLOYMENT REPRESENTATIVE, DEPT. CW

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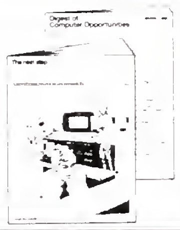

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East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, D.C. (703/790-5610).

Midwest: Chicago (312) 782-0857), Cleveland (216/771-2070), Detroit (313/352-6520), Kansas City (816/474-3393), Minneapolis (612/544-3600), St. Louis (314/862-3800).

South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).

West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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- 10 years of successful supervisory experience in software development
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- Broad knowledge of computer software industry trends, new products and advance systems technology
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SYSTEMS ANALYST

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Send resume to:

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Our client, a major 370/145 OS VS/1 shop, is expanding their staff and adding a second 145. Positions available include: one systems programmer to $19,500, which requires CICS; 7 Batch Cobol prog/analysts; 3 on-line programmer analysts with CICS to $19,000; and one project leader to $22,000 with heavy on-line design. Some relocation allowance will be provided for applicants living outside of the Los Angeles area.

Client Company Pays All Fees
Phone or Write Duncan White
(213) 386-6805
Los Angeles, Suite 1914
3600 Wilshire Blvd. LA 90010
Orange County, Suite 501
P.O. Box 1656 Orange, 92668

PROGRAMMER ANALYST

The Management Information Services Department of ICI United States, Inc. seeks an individual who is looking for growth and opportunity. The successful candidate will possess 2 to 4 years industry experience in COBOL ANS (360/370) plus 3330 disks. DOS and OS JCL plus IMS experience a definite plus. Degree preferred. We offer excellent compensation as well as a full range of company benefits. Candidates should send a resume of education, experience and salary history to:

Joan Efford

ANTICIPATING NEEDS

ICI United States Inc.

PROGRAMMERS/ ANALYSTS

Boeing Computer Services Richland, Inc., Richland, Washington has immediate openings for Programmers Analysts.

Positions will require candidates to analyze, design, code and document complex applications to large-scale electronic computers and associated equipment for business systems.

Applicants for the following positions are being sought:

- **Business Systems Programmer**
  Duties will be to provide experience to future business systems applications in the concept of top-down design and structured programming. Assignment will also include the analysis, design and coding of major business systems. Requirements are 3 to 5 years of large business system experience, 2 to 3 of which are top-down design and structured programming. Candidate should be strong technically to assume lead programming position. Degree or equivalent experience required.
- **Business Finance Programmer**
  Duties will be maintenance and modification to the BCSR general ledger system. Requirements include 3 to 4 years of COBOL experience and a background in financial systems.
- **Data Base Programmer**
  Duties include the participation in a Data Base Requirements study, followed by the design and development of Data Bases utilizing a Data Base Management System. Other duties consist of training, consultation, performance measurement and optimization of Data Base applications. Experience required with data base design and at least 5 years in application programming or systems analysis. Degree desirable but equivalent work experience acceptable.

Boeing Computer Services Richland, Inc. provides vital support services to the Energy Research and Development Administration's Hanford Complex.

The Tri-Cities, Richland, Pasco and Kennewick, are well known for a temperate climate, numerous recreational facilities, superb educational systems and excellent living conditions.

Submit your résumé to or call Wally Webster, (509) 942-7784, Boeing Computer Services, Richland, Inc., Room 149-B1, P.O. Box 300-A4, Richland, WA 99352

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BCS BOEING COMPUTER SERVICES INC

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Cambridge, Ohio

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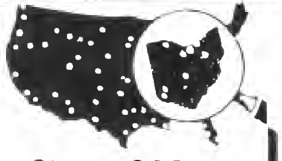

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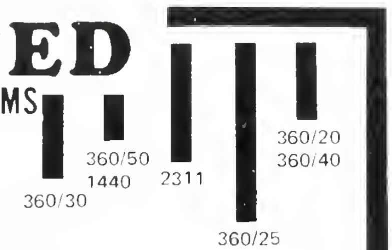

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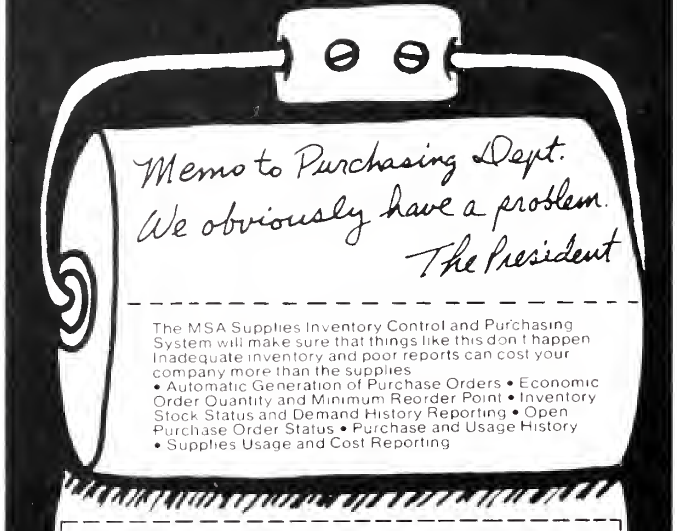
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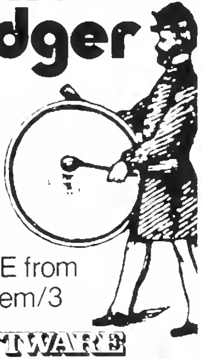

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COMPUTERWORLD, 797 Washington St., Newton, Mass. 02160

Ampex Has 'Significantly Successful Year'

REDWOOD CITY, Calif. – For Ampex Corp., fiscal 1976 was a "significantly successful year," President Arthur H. Hausman said.

The firm showed an 89% increase in its pretax income from continuing operations exclusive of nonrecurring items for the year, and for the fourth quarter, this item rose to $2.9 million compared with $278,000 in the year-ago period.

If it had not been for the accounting treatment for the proposed settlement of class action suits brought by purchasers of the firm's securities between May 1970 and August 1972, earnings for the year would have been about the same as last year's earnings, which included a $13 million settlement from IBM, Hausman observed.

"This is the fourth consecutive year of substantial improvement in the company's operations," he added.

For the year, revenues totaled $257.9 million compared with $244.9 million in 1975.

Income from continuing operations before income from nonrecurring items and taxes on income rose to $9.4 million compared with $5 million last year.

Earnings totaled $8 million or 74 cents a share for the year compared with $10.3 million or 95 cents a share last year when there was a $13 million credit from the IBM settlement.

During the quarter ended May, revenues climbed to $67.4 million compared with $64.1 million last year.

Earnings totaled $844,000 or 8 cents a share, including a $1.1 million charge for settlement of class action suits, compared with a loss of $2.5 million or 54 cents a share last year.

During the year Ampex reduced its debt by $33 million, bringing consolidated corporate debt from a high of $253 million in mid-fiscal 1972 to $110 million at the close of fiscal 1976, including $60 million of subordinated debentures.

"This debt reduction of $143 million, combined with interest payments to our lenders and debenture holders, totals over $200 million in repaid principal and interest," Hausman said.

MDS Year Shows Profit For First Time Since '70

PARSIPPANY, N.J. -- Mohawk Data Sciences Corp. (MDS) managed to show an annual profit for the first time since 1970, the firm said.

Aided considerably by special credits, both the fourth quarter and year ended April 30 were profitable.

During the year the firm earned $13.6 million or $1.92 a share, including an $11.5 million special credit, compared with a loss of $21.7 million or $3.47 a share last year.

Revenues Declined

Revenues for the year declined to $161.7 million compared with $170.1 million last year.

Rentals and service income rose slightly to $109.5 million from $109.4 million last year, while sales declined to $52.2 million compared with $60.7 million in 1975.

The firm also included currency translation gains of $2.2 million in fiscal 1976 profits. Translation losses of $1.7 million were recorded in the previous year.

For the fourth quarter, the firm showed earnings of $10.2 million or $1.39 a share, including special credits of $9.4 million.

This compared with the year-ago period's loss of $11.5 million or $1.84 a share. The 1976 special credits were from the firm's debenture exchange offer.

Revenues for the quarter declined to $41 million compared with $44.5 million in the same period last year, with both sales and rentals and service income showing declines.

Sales dropped to $14.6 million from $15.8 million and rentals and service income declined to $26.4 million compared with $28.7 million in the year-ago quarter.

GA Cuts Losses In Nine Months

ANAHEIM, Calif. - General Automation, Inc.'s (GA) losses grew during the third quarter but diminished in the nine months compared with those of the year-ago periods.

Shipment slippages into the fourth quarter were primarily responsible for the third-quarter loss, according to Lawrence A. Goshorn, GA president.

"These delays were caused by several necessary fundamental changes in our manufacturing operations in the quarter," he said, adding GA expects the fourth quarter to be a record quarter for shipments.

During the third quarter, revenues rose to $14.5 million compared with $13.2 million in the same period last year.

However, the loss grew to $1.4 million or 57 cents a share compared with a loss of $660,000 or 27 cents a share a year ago.

In the nine months, revenues climbed to $47.8 million compared with $41.4 million. Losses were cut to $1.2 million or 50 cents a share compared with the $2.5 million or $1.02 a share loss in the same period last year.

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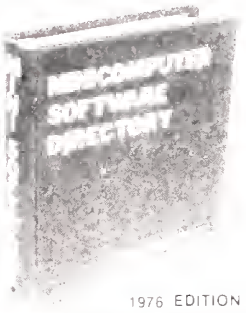

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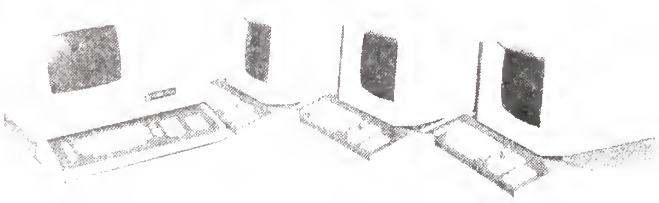

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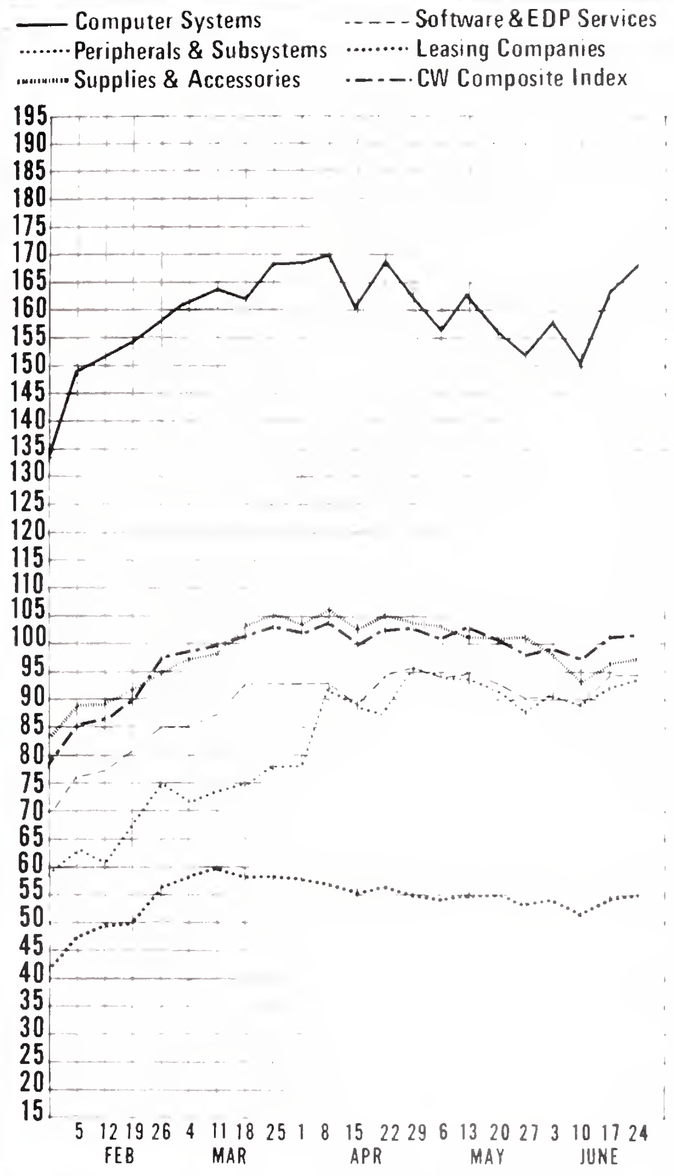

Earnings Reports

INCOTERM

Year Ended Feb. 29

	a1976	1975
Shr Ernd	$1.24	$.12
Revenue	32,696,000	21,404,000
Tax Cred	276,000	175,000
Earnings	2,500,000	325,000
3 Mo Shr	.29	.34
Revenue	8,752,000	7,408,000
Tax Cred	83,000	175,000
Earnings	590,000	623,000

a-Preliminary.

INFOREX

Three Months Ended April 2

	1976	a1975
Shr Ernd	$.12	$.03
Revenue	14,907,000	13,146,000
Tax Cred	141,000	58,000
Earnings	353,000	79,000

a-Restated to reflect accounting change for foreign currency translation.

APPLIED DATA RESEARCH

Three Months Ended March 31

	1976	1975
Shr Ernd	$.27	$.02
aRevenue	3,331,421	b3,220,253
Disc Op	......	(87,397)
Tax Cred	163,000	11,000
Earnings	332,715	23,325

a-From continuing operations. b-Restated.

COMDISCO

Three Months Ended March 31

	1976	1975
Shr Ernd	$.66	$.31
Revenue	18,871,800	7,016,443
Earnings	747,693	380,373
6 Mo Shr	1.04	.48
Revenue	37,939,752	19,182,920
Earnings	1,218,124	589,050

COMPUTERVISION

Three Months Ended March 31

	1976	1975
Shr Ernd	$.04	.....
Revenue	6,798,000	$4,669,000
Tax Cred	33,000	.....
Earnings	105,000	(178,000)

DATA 100

Three Months Ended March 31

	1976	1975
Shr Ernd	$.26	$.40
Revenue	29,284,000	20,852,000
Tax Cred	126,000	580,000
Earnings	946,000	1,380,000

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TRADE*QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 23, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	101	+1 1/4	+1.1
O	COMPUTER AUTOMATION	10- 19	16 3/4	+1 3/4	+11.6
N	CONTROL DATA CORP	12- 27	22 3/8	+ 1/8	+0.5
N	DATA GENERAL CORP	40- 60	52 5/8	+ 1/2	+0.9
O	DATAPOINT CORP	24- 45	44 1/4	+2 1/2	+6.[illegible]
O	DIGITAL COMP CONTROL	2- 7	6 3/8	+1 1/2	+[illegible].7
N	DIGITAL EQUIPMENT	138-181	173 1/2	+7 1/4	+[illegible]
N	ELECTRONIC ASSOC.	2- 5	2 3/4	- 3/8	-12.0
A	ELECTRONIC ENGINEER.	7- 16	11 7/8	+ 1/4	+2.1
N	FOXBORO	28- 45	44 1/8	- 7/8	-1.9
O	GENERAL AUTOMATION	5- 11	7 1/2	- 1/8	-1.7
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	111 1/4	- 1/4	-0.1
N	HONEYWELL INC	34- 56	49 5/8	+1 5/8	+3.4
N	IBM	227-272	272	+9 1/2	+3.6
O	MANAGEMENT ASSIST	1- 3	1 7/8	0	0.0
O	MEMOREX	13- 33	29 1/8	- 3/8	-1.3
O	MICRODATA CORP	10- 26	22 3/4	+ 7/8	+4.0
O	MODULAR COMPUTER SYS	9- 14	13	- 1/4	-1.9
N	NCR	24- 33	32 3/8	+ 1/8	+0.[illegible]
O	PRIME COMPUTER INC	4- 11	9 1/4	+ 1/2	+5.7
N	PERKIN-ELMER	19- 27	23 1/2	+2 1/4	+10.5
N	RAYTHEON CO	45- 60	54 1/2	- 3/8	-0.6
N	SPERRY RAND	40- 51	50 1/4	+1 3/8	+2.9
O	SYCOR INC	20- 31	27	+1 1/2	+5.8
A	SYSTEMS ENG. LABS	6- 10	8	0	0.0
N	VARIAN ASSOCIATES	13- 17	14 7/8	+ 7/8	+6.2
A	WANG LABS.	11- 20	14 1/2	+1 7/8	+14.8

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	5 3/4	- 1/4	-4.1
A	COMMERCE GROUP CORP	2- 3	2 3/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	2	0	0.0
M	DATRONIC RENTAL	1- 1	1 1/8	- 1/8	-10.0
A	DCL INC	1- 1	3/4	0	0.0
N	DPF INC	5- 7	6 1/4	+ 1/8	+2.0
A	GREYHOUND COMPUTER	3- 8	7 1/8	0	0.0
N	ITEL	6- 13	12 1/2	+1 1/4	+11.1
N	LEASCO CORP	6- 14	12	+ 3/8	+3.2
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 1/4	+ 3/8	+5.4
N	U.S. LEASING	7- 12	9 1/2	0	0.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 5/8	0	0.0
O	ANACOMP INC	[illegible]- 11	9 3/4	0	0.0
A	APPLIED DATA RES.	2- 3	2 7/8	+ 1/8	+4.5
N	AUTOMATIC DATA PROC	[illegible]	[illegible]	- 3/[illegible]	-[illegible]
O	COLEMAN AMERICAN COS	4- 5	[illegible]	0	0.0
O	COMPUTER DIMENSIONS	3- 7	4 3/4	0	0.0
O	COMP ELECTION SYSTMS	[illegible]	7 1/2	0	0.0
O	COMPUTER HORIZONS	1- 2	2	+ 1/2	+[illegible]
O	COMPUTER NETWORK	2- 6	5/8	0	0.0
N	COMPUTER SCIENCES	4- 8	[illegible] 1/8	0	0.0
	COMPUTER TASK GROUP	1- 1	1 [illegible]	0	0.0
O	COMPUTER USAGE	3- 6	[illegible] 1/2	- 1/4	-[illegible]
O	COMSHARE	[illegible]	[illegible]	- 3/4	-[illegible]
O	DATA DIMENSIONS INC	2- 4	[illegible]	- 1/8	-3.[illegible]
O	DATATAB	1- 1	1	0	0.0
N	ELECTRONIC DATA SYS.	12- 1[illegible]	13 1/4	-1 3/4	-1[illegible]
O	INFONATIONAL INC	1- 1	1/2	0	0.0
O	INSYTE CORP	1- 3	1 7/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	[illegible]	[illegible]	[illegible]
O	KEYDATA CORP	3- 5	[illegible]	+ 1/[illegible]	+4.[illegible]
O	LOGICON	4- [illegible]	[illegible]	0	0.0
A	MANAGEMENT DATA	2- 3	[illegible]	- 1/8	-5.8
A	NATIONAL CSS INC	13- 25	[illegible] 7/8	+1	+5.[illegible]
A	ON LINE SYSTEMS INC	19- 2[illegible]	17 [illegible]	- 5/[illegible]	-[illegible]
N	PLANNING RESEARCH	3- 5	[illegible] 1/2	- 1/[illegible]	-[illegible]
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	3- 5	3 1/[illegible]	+ 3/[illegible]	+1[illegible]
O	REYNOLDS & REYNOLDS	13- 21	17 1/2	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	TYMSHARE INC	19- [illegible]	[illegible] 5/8	+ 1/2	+1.9
A	UPS SYSTEMS	2- 5	2 5/8	- 1/8	-[illegible]
N	WYLY CORP	2- 7	[illegible] 5/8	- 3/[illegible]	-1[illegible]

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	[illegible] 7/8	- 3/[illegible]	-[illegible]
O	ADVANCED MEMORY SYS	4- 10	7 1/2	- 3/4	-[illegible]
N	AMPEX CORP	5- 8	7 1/2	- 1/[illegible]	-1.[illegible]
O	ANDERSON JACOBSON	2- 4	[illegible] 1/8	+ 3/8	+13.6
O	APPLIED DIG DATA SYS	13- 25	24 1/4	+ 1/4	+1.0
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/2	0	0.0
A	BOLT,BERANEK & NEW	7- 10	9 3/8	+ 3/4	+[illegible].6
N	BUNKER-RAMO	5- 8	7 7/8	+ 5/8	+8.[illegible]
A	CALCOMP	4- 7	5 7/8	+ 7/8	+1[illegible]
O	CAMBRIDGE MEMORIES	2- 5	3 5/8	+ 1/8	+[illegible]
N	CENTRONICS DATA COMP	20- 36	32 1/4	+ 1/4	+0.7
O	CODEX CORP	22- 42	31 1/2	-3	-8.[illegible]
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 5	3 5/8	+ 1/8	+3.5
O	COMPUTER CONSOLES	4- 7	5 3/4	- 1/2	-[illegible]
A	COMPUTER EQUIPMENT	1- 3	1 3/4	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	1 3/8	+ 1/8	+10.0
O	COMTEN	4- 9	7	0	0.0
N	CONRAC CORP	20- 25	23	- 1/8	-0.5

EXCH		1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
[illegible]	DATA [illegible] SYSTEM	1- [illegible]	[illegible]	+ [illegible]	+7.1
	DATA 100	7- [illegible]	[illegible]	- [illegible]	-[illegible]
A	DATA [illegible]	[illegible]	[illegible]	+ [illegible]	+[illegible].1
	DATA [illegible]	[illegible]	[illegible]	+ [illegible]	+[illegible]
O	DATUM INC	[illegible]	[illegible]	+ [illegible]	+[illegible]
O	[illegible]	1- [illegible]	[illegible]	[illegible]	[illegible]
	DELTA DATA SYSTEMS	1- 1	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	1- [illegible]	[illegible]	[illegible]	-[illegible]
[illegible]	FABRI-TEK	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	HAZELTINE CORP	[illegible]	[illegible]	+ [illegible]	+1.[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+[illegible]
A	[illegible]	[illegible]	[illegible]	+ [illegible]	+1.[illegible]
O	[illegible]	[illegible]	[illegible]	+ [illegible]	+[illegible]
	INFORMATION [illegible]	[illegible]- 1	[illegible]	+	+[illegible]
[illegible]	INTEL	[illegible]	[illegible]	[illegible]	-[illegible]
A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	+[illegible]
A	[illegible]	[illegible]	[illegible]	[illegible]	-[illegible]
N	MOHAWK DATA [illegible]	[illegible]	[illegible]	[illegible]	-[illegible].1
O	[illegible]	1	[illegible]	+ [illegible]	+[illegible]
A	[illegible]	[illegible]	[illegible]	+	+[illegible]
A	POTTER [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	7- [illegible]	[illegible]	[illegible]	[illegible]
O	QUANTOR [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	RECOGNITION EQUIP	[illegible]	[illegible]	[illegible]	+[illegible]
N	SANDERS ASSOCIATES	[illegible]	[illegible]	[illegible]	-[illegible]
	SCAN DATA	[illegible]	[illegible]	[illegible]	-[illegible]
O	STORAGE TECHNOLOGY	[illegible]	[illegible]	[illegible]	-[illegible]
	[illegible]	[illegible]	[illegible]	+ [illegible]	+[illegible].7
O	TALLY [illegible]	[illegible]	[illegible]	[illegible]	-[illegible].7
	TEC INC	[illegible]	[illegible]	[illegible]	-[illegible]
N	TEKTRONIX INC	[illegible]	[illegible]	[illegible]	+[illegible].4
A	[illegible]	[illegible]	[illegible]	- [illegible]	-[illegible]
O	WANGCO INC	[illegible]	[illegible]	[illegible]	+11.[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	+[illegible]

[illegible]

EXCH		1976 RANGE (1)	CLOSE JUN 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
[illegible]	ADVANCE [illegible]	[illegible]	[illegible]	[illegible]	+[illegible]
[illegible]	BALTIM[illegible]	[illegible]	[illegible]	[illegible]	0.0
A	BARRY WRIGHT	[illegible]	[illegible]	+ [illegible]	+[illegible]
O	CYBERMETRICS INC	[illegible]	[illegible]	[illegible]	-[illegible].5
A	DATA [illegible]	[illegible]	[illegible]	[illegible]	-0.7
O	DUPLEX PRODUCTS [illegible]	[illegible]	[illegible]	[illegible]	0.0
N	ENNIS BUS. FORMS	[illegible]	[illegible]	- [illegible]	-1.8
[illegible]	GRAHAM [illegible]	[illegible]	[illegible]	[illegible]	-3.0
O	GRAPHIC [illegible]	[illegible]	[illegible]	+ [illegible] 1/4	+8.7
[illegible]	3M COMPANY	[illegible]	[illegible]	+ [illegible]	+3.3
O	MOORE [illegible] LTD	[illegible]	[illegible]	- [illegible]	-1.7
N	NASHUA [illegible]	[illegible]	[illegible]	+ 3/4	+5.0
O	STANDARD REGISTER	[illegible]	[illegible]	- 1/2	-3.1
O	TAB PRODUCTS [illegible]	[illegible]	[illegible]	+ 1/4	+2.7
N	UARCO	[illegible]	[illegible]	+ 1/4	+1.1
O	VANIER GRAPHICS	[illegible]	[illegible]	0	0.0
A	WABASH MAGNETICS	4- [illegible]	[illegible]	+ 5/8	+10.2
N	WALLACE BUS FORMS	19- [illegible]	[illegible] 1/4	+ 1/4	+1.[illegible]

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